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LOGI - MONI

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VOLUME



Logia (Gr., sayings). The name given to an ancient collection of discourses of Jesus Christ. According to Papias, probably a disciple of S. John, "Matthew composed the logia of the Lord in the Hebrew tongue." Hence the name is sometimes given to the supposed document, consisting largely of discourses, drawn upon, through a Greek translation, by the writers of the Gospels according to S. Matthew and S. Luke, and designated Q. (*See* Gospels.)

The name logia is also given to several fragmentary collections, professing to be sayings of Jesus, on 3rd cent. papyri, found in Egypt by Grenfell and Hunt in 1897 and 1903. They have been published as *Sayings of Our Lord* from an Early Greek Papyrus, 1897, and *New Sayings of Jesus and Fragment of a Lost Gospel*, 1904. Whether authentic or not, they preserve an early tradition.

Logic (Gr. *logos*, word). The science of reasoning. Logic deals systematically with the principles which regulate valid thought, that is, thought of which the conclusions are justified by the facts given. Logic does not itself provide new knowledge, as, say, chemistry may do, but furnishes a set of rules that help a man to gain new knowledge, to judge whether any given evidence is sufficient to prove a given statement, and to perceive what additional statements can justifiably be inferred from any given statements. For this reason logic has also been called the science of proof and the study of the general conditions of valid inference.

A knowledge of logic will not prevent anyone from coming to wrong conclusions, any more than a knowledge of hygiene will prevent the formation of unhealthy habits; but it does furnish a means of testing conclusions on any matter and the processes of argument by which they have been derived. Practice in logical analysis should enable anyone to perceive more easily fallacies hidden in the arguments and conclusions of others. The study of logic should assist correct thinking, as the study of grammar should assist correct speech. There were clear thinkers before there were logicians — otherwise the rules of logic could not have been formulated; but everyone should be a better thinker and a better judge of the conclusions of others if he is practised in logical analysis. A knowledge of logic cannot confer infallibility—it should not be forgotten that the greatest logicians of an-

cient and medieval times, because they were convinced, found it possible to "prove," for example that the sun moved round the earth and that the earth was flat. But logic can provide an instrument for checking conclusions, and can focus attention on the various sources of error, so that the logician has really no excuse for believing that he is infallible.

The subject-matter of logic is usually presented in two parts, formal logic and inductive logic or scientific method. The first of these is concerned primarily with deductive reasoning, which assumes the truth of certain statements (or premises, that is, things placed before), and deduces conclusions from them, that is, uses them to formulate other statements implied by them. Inductive reasoning, on the other hand, starts with observed facts and tries to discover what general principles (or laws) underlie and explain them. A lawyer interpreting a statute and applying it to a particular case uses the deductive method; a scientist observing an experiment and interpreting the results uses principally the inductive method. In most forms of practical thinking induction and deduction are combined freely. In the study of logic it is convenient to treat them separately.

FORMAL LOGIC. This analyses the different types of proposition and the various ways in which inferences can be validly made from them. Every proposition has a subject and a predicate. Thus in "The furniture in this room is worth £150," the subject is "the furniture in this room"; the predicate is "(something) worth £150." The subject and the predicate are called the terms of the proposition. A statement may be made concerning one thing or one group of things; e.g., *This cup of tea is strong*; *The furniture in this room is insured*. The proposition is then said to be singular. Or a statement may relate to any and every object of a certain class; e.g., *Armchairs are comfortable*;

No man is infallible. Such propositions are called general. The subject term is said to be distributed. A third type of proposition uses the subject indefinitely; e.g., *Some houses have been rebuilt*. These propositions are called particular.

Using S to denote the subject-term and P to denote the predicate term, we can classify the simplest forms of proposition as (1) All or every S is P; (2) Some S is P; (3) All and every S is not P; (4) Some S is not P. Of these four types, the first two affirm something of the subject; the second two deny (Latin *negō*) something of the subject; the four types are therefore commonly referred to respectively as A, I, E, O propositions. Much of formal logic deals with the limitations on the use of these four types of proposition. They are commonly denoted by the symbols SaP, SiP, SeP, SoP.

Two assumptions essential to consistent thinking are known as the law of contradiction and the law of the excluded middle. According to the first, the same predicate cannot be both affirmed and denied of the same subject (S cannot be both P and not P). According to the second, a given predicate must be either affirmed or denied of a given subject (S must be either P or not P; there is no middle course).

Different immediate inferences are implied in the A, I, E, O propositions. Thus: SaP implies SiP but denies SeP and SoP; that is, if every S is P, some S must be P, and it is false to say that no S is P or some S is not P. On the other hand, SiP does not itself imply SaP, although SaP may also be true; and SiP excludes SeP but it neither affirms nor denies SoP. These relationships of the four types of proposition are systematically summarised in the traditional square of opposition. A proposition may imply also (a) its converse or (b) its obverse. Thus: the proposition, *The greatest side of a triangle is opposite to the greatest angle* has the converse, *The greatest angle of a triangle is opposite to the greatest side*, and the obverse, *The greatest side of a triangle is not opposite to the least angle*.

SYLLOGISM. Mediate inference involves the use of two propositions containing a common term to derive a new proposition, the truth of which follows as a necessary consequence. Thus:

Educated people are tolerant;
He is educated;
Therefore, he is tolerant.

Such an inference is usually called a syllogism. The derived proposition is called the conclusion. The predicate of the conclusion (denoted by P) is called the major term. The subject of the conclusion (S) is called the minor term. The term appearing in both premises but not in the conclusion is called the middle term (M). Thus in the example we have: Major term, *tolerant (persons)*; minor term, *he*; middle term, *educated people*. The syllogism could be symbolised thus:

(Major Premise) MaP;

(Minor Premise) SaM;

(Conclusion) SaP.

The A, I, E, O propositions can be combined to yield nineteen different types or moods of valid syllogism. The scholastic logicians of medieval times concerned themselves principally with these forms of syllogism and devised elaborate rules and mnemonics regarding the different moods. The following two general rules of the syllogism are important: (1) The middle term must be distributed at least once in the premises. (2) No term may be distributed in the conclusion if it is not distributed in its premise. A fallacy is an invalid inference; e.g., Educated people are tolerant; he is tolerant; therefore he is educated. This is an example of the fallacy of the undistributed middle term. The word *tolerant* in neither premise denotes all and every tolerant person.

Chains of Reasoning

A chain of reasoning consists of syllogisms so linked that the conclusion of one is used as the premise of another. For example: Educated people are tolerant; he is educated; therefore, he is tolerant. Tolerant persons are good workmates; he is tolerant; therefore, he is a good workmate. No good workmate would tell tales of his fellows; he is a good workmate; therefore, he would not tell tales. Such syllogistic chains of reasoning have usually to be disentangled by analysis of the words used. Thus, that just given might have been expressed as follows: He would not tell tales, for like all educated people he is tolerant, and therefore a good workmate, and hence incapable of tale-bearing. The chief function of formal logic is to analyse chains of reasoning in order to decide whether the syllogisms are valid and to express the premises fully so that they can be adequately considered.

SCIENTIFIC METHOD. Inductive logic deals with the methods by which new knowledge can be gained.

Observation and experiment provide the raw materials of facts. These can be critically examined, analysed, classified, and grouped, described, compared, contrasted, and considered imaginatively in order to discern common factors, similarities, differences, or causal relationships; suppositions or hypotheses can be formulated to explain tentatively what has been observed; these suppositions can be checked by seeing if they apply equally to other observations of the same kind; they can be corrected and re-checked; eventually a generalisation or scientific law can be formulated that fits the evidence beyond all doubt.

The Place of Statistical Analysis

During this century remarkable progress has been made in the technique of accurate observation, in the design and conduct of experiment, and in the analysis of the results of observation and experiment. The analysis is usually mathematical and statistical in character, whether the observations concern, say, astronomy, physics, agriculture, sociology, engineering, or dietetics. But the mastery of statistical method is no substitute for the constructive imagination that can perceive that a problem exists, determine the kind of observation or experiment that may provide the requisite evidence, and then recognize the significance of the results secured, either with or without the aid of statistical analysis. **H. Watson**

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Logistics. Military term, originally coined to denote the art of moving and quartering armed forces. The French term *logistique*, of which it is a rendering, was first used by the military writer Jomini, and is derived from *loger*, to lodge. The word is now obsolete in Great Britain and on the Continent, but is still current in the U.S. army, covering roughly those aspects of the duties of "Q" branch, supplies, transport, and quartering, which are concerned with keeping an army mobile and ready to fight. Thus, a force unable to send forward enough ammunition for its artillery would be described as "logistically unsound." See Staff.

Logogram (Gr. *logos*, word; *gramma*, letter). A symbol or type sign used to represent a word or the termination of a word, for the sake of brevity and speed in writing, e.g. / for "the." Logogram is also the name given to a puzzle in verse. A word is chosen, and from its constituent letters words are made, synonyms of which are introduced into the verse, and from these the original word has to be guessed. Thus, if the word exhaustion were chosen, from which the words haste, heat, stone, etc., can be made, synonyms such as speed, warmth, pebble, would be introduced into the lines, giving clues from which the word exhaustion could be discovered.

Logone. A river and native state of Africa. The river rises in French Cameroons, and forms the boundary between that colony and French Equatorial Africa. It runs N.N.W. from the neighbourhood of Bakassi to its confluence with the Shari, just below Port Lamy. The Logone is navigable for launches as far as Ham, whence there is portage and water communication with the Benue.

Formerly a vassal state of Bornu, the state of Logone now forms part of Cameroons. The country is swampy. The native capital is at Birni Logone, but the administrative centre is Kesseri, a few miles above the confluence of the Logone and the Shari.

Logos (Gr., word). Greek term much used in philosophy and theology. In philosophy it implies either reason or reason as expressed in speech; in the Jewish and Christian religions, the Word or medium of divine revelation. Heraclitus, Plato, and the Stoic philosophers attributed the rational order of the world to a divine Logos, Reason, or Mind. The Hebrew-speaking Jews used the word Memra in the sense that the Greeks used Logos, and in the Targums, or Aramaic paraphrases of the O.T., speak not of Jehovah, but of His Memra as manifested to Abraham, Hagar, Jacob, and Moses.

Combining Greek philosophy with Jewish thought and tradition, St. John, in the beginning of his Gospel, defines a Christian doctrine of the Logos, referring to Christ as (1) the inward Word of God, i.e. as much one with God the Father as reason is one with reasoning man; and (2) as God's outward Word, because he explains and reveals to the world what God is, and, by becoming flesh, and living a sinless human life, showed man how to become like God. In the

words of St. Augustine "the Son is called the Word of God because the Father made known His Will by Him, as a man makes known his mind by words."

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Logotype. In printing, two or more letters, a word, or a phrase cast as one piece of type, e.g. or, of, in, on, ed, the, tion. It should be distinguished from a ligature, which consists of two or more connected letters, like ff or æ. Logotypes have not been used extensively except by John Walter, founder of The Times, and early in the 19th century by Earl Stanhope. They are used in the setting up of work involving numerous repetitions of the same sequence of letters, as in directories and dictionaries. Logotypes reduce the number of hand movements to be made by the operator in picking up type or depressing keys. On the other hand, they increase the number of compartments in a case of type or keys on a keyboard to be memorised by the compositor. Also damage to any one character of a logotype necessitates replacement of the whole combination.

Logroño. Small inland province of N. Spain. It is bounded N. by the river Ebro, and lies mostly within its basin. To the S.W. lie the Sierra de la Demanda, alt. 7,562 ft., and the Pico de Urbión, 7,388 ft. The fertile region S. of the Ebro, known as La Rioja, is famous for its red wines. Logroño also produces cereals, olive oil, fruit, flax, honey, and silk. There are some minerals, including silver, copper, and lead. Area, 1,946 sq. m. Pop. (1950) 229,791.

Logroño. A town of Spain, capital of the prov. of Logroño. It crowns a hill 1,200 ft. above the fertile plain of the river Ebro, 61 m. E. of Burgos, on the Saragossa-Miranda de Ebro rly. The Ebro is here spanned by two bridges - one built of stone in 1138, the other modern. The town is walled, and its church is said to have been founded by Constantine. The centre of La Rioja district, Logroño has a large trade in wine and fruit. Named by the Romans Julia Briga and afterwards Lucronia, it was besieged by the French in 1521 and occupied by them 1808-13. Pop. (1950) 51,975.

Logwood. The heart wood of a tree, *Haematoxylon campech-*

ianum, a native of the warmer parts of S. America and the W. Indies. It was first imported to Europe by the Spaniards in the 16th century; about 1715 trade was developed with Jamaica, whence some of the best grades now come. Its value depends



Logwood. Foliage and flowers of this American evergreen tree

upon the presence of a colouring principle, haematoxylin, which is readily oxidised to a red dye, haematein. This is extracted and used in large quantities for dyeing wool and silk, generally with a chromium or an iron mordant. Leather, rayon, and other materials are also dyed with logwood. The extract is prepared near the plantations in Jamaica, where the wood is reduced to chips and extracted with hot water. *Consult* Natural Organic Colouring Matters, Perkin and Everest, 1918.

Loharu. Small town of Punjab, India, in Mohindragarh dist., formerly the capital of Loharu, a princely state, area 226 sq. m., which was ruled by a nawab who traced his descent from a Mokhara Mogul serving under the emperor Ahmad Shah. Lord Lake granted a perpetual estate to the nawab, but trouble occurred in that ruler's relations with the East India Company and with his own family. In 1874 the British government revived the title of nawab in favour of Ala-ud-din Ahmad Khan. Loharu lay within the Patiala and East Punjab states union, formed 1948, absorbed 1956 in Punjab.

Lohengrin (i.e. Garin of Lorraine). In medieval German romance, one of the heroes of the Grail cycle. He is the subject of a High German poem, composed c. 1300, in continuation of Wolfram's Parsifal. The son of Parsifal, and a knight of the Holy Grail, he is conveyed by a swan through the air at King Arthur's command to rescue Elsa, daughter of the duke of Brabant. Overcoming her enemy, he marries Elsa, who is not to inquire of him as to his

origin. She persists in doing so, and when he is persuaded to tell her the swan carries him away again to the Grail. Wagner took this legend as theme for his opera, Lohengrin, 1848. *See* Wagner.

Lohmann, GEORGE ALFRED (1865-1901). English cricketer. Born June 2, 1865, he became at 20 one of the most successful bowlers of the day, and a mainstay of the Surrey team. During 1885-90 he was indispensable to any representative English eleven. He took over 200 wickets in first-class matches in each season, 1888-90, his averages being 10.90, 13.43, and 13.62 runs. He played in nine test matches against Australia, securing his wickets at an average cost of 13.01 runs apiece. Lohmann died Dec. 1, 1901.

Löhr, HERMANN (1871-1943). A British song writer. Born at Plymouth, son of a theatrical conductor, he studied at the Royal Academy of Music, where he gained the Charles Lucas medal for composition. He wrote more than 200 songs and ballads, the best known being My Little Grey Home in the West, popular with the troops and much parodied by them during the First Great War; and Where my Caravan has Rested, of which a million copies were sold. He died Dec. 6, 1943.

Löhr, MARIE (b. 1890). Australian actress. Born at Sydney, July 28, 1890, she first appeared on the London stage in Shock-Headed Peter, 1901. Engaged by the Kendals in 1907, she made her reputation in the comedy, My Wife, at the Haymarket Theatre. Then she ap-



Marie Löhr, Australian actress

peared with Tree at His Majesty's, and in 1911 with Hare. Manager of the Globe Theatre, 1918-25, she produced and acted in such successes as Nurse Benson; The Laughing Lady; Aren't We All? Later came The Breadwinner, 1931; Call it a Day, 1935; Quiet Wedding, 1938; Playbill, 1948. In films from 1932, she displayed adroit sophisticated humour.

Loir. River of France. It rises in the dept. of Eure-et-Loir and flows generally S.W. to fall into the Sarthe near Angers. Its length is about 180 m.

Loire. River of France. It rises in the Cévennes, in the dept. of Ardèche, and flows N. and then

W. into the Atlantic, which it enters at St. Nazaire. The longest river in France, it flows some 620 miles through much picturesque scenery. Among the towns on its banks are Orléans, Blois, Tours, Angers, and Nantes. The chief tributaries on the left bank are the Allier, Cher, Indre, and Vienne; those on the right include the Maine. The river drains nearly 50,000 sq. m.

The Loire flows irregularly, rising at times with great rapidity and flooding the country near it. It is at times navigable for small vessels for a great part of its course, but it is not of much value as a commercial highway. Canals have been cut parallel to and linking stretches of the river; the Canal du Centre and others connect the Loire with other rivers. Attempts have been made to lessen the destructive Loire floods. Dykes and embankments have been built, and there are several dams, notably the great one near Roanne.

Loire. Department of France. It is in the E. centre of the country, and takes its name from the river Loire. Much of it is hilly and it contains part of the Cévennes range; but it also contains the plains of Forez and Roanne. Its chief rivers, besides the Loire, are the Lignon du Nord, the Gier, the Aix, and the Ondaine; the Rhône just touches it.

In the N. Loire is an agricultural district, cattle being reared, and wheat and rye grown. In the S. is a large coalfield, on which are the manufacturing towns, of which St. Étienne is centre. St. Étienne is the capital of the department and of one of the three arrondissements. Roanne and Montbrison are the capitals of the others. Other large towns are Chambon-Feugerolles, Firminy, La Ricamarie, Rive-de-Gier, Roche-la-Molière, and St. Chamond. Before the Revolution the district forming the department was part of the province of Lyonnais. Area 1,852 sq. m. Pop. (1954) 654,482.

Loire-Atlantique. Department of France. It is in the W. of the country, the Bay of Biscay forming its W. boundary. It is a generally flat and marshy district, subject to floods and drained by the Loire and its tributaries, including the Erdre and the Sèvre. A number of canals have been constructed through it.

Loire-Atlantique is a fine agricultural region and yields heavy crops of cereals; horses and cattle are reared, and dairy farming is

carried on. Salt is extracted from the marshes, granite is quarried, and there are fisheries off the coast. The department is divided into four arrondissements, Nantes, Châteaubriant, St. Nazaire, and Ancenis. Nantes is the capital; other large towns are Coueron, Escoublac-la-Baule, and Rezé. Guérande, Clisson, and Paimboeuf are interesting towns. In the S. is the large lake of Grandlieu. Until the Revolution the department was in the province of Brittany. Area, 2,693 sq. m. Pop. (1954) 733,575.

Loiret. Department of France. In the centre of the country, it takes its name from a small tributary of the Loire. The Loire itself flows through this department, as do the Essonne and the Loing. The department is mainly plain or plateau. It contains the Gâtinais, part of the wheat growing district called the Beauce, and a section of the infertile plain called the Sologne. Cattle, sheep, and other livestock are abundant, and wheat is grown; the vine is cultivated, and a large area is covered by forest. Orléans is the capital, and there are three arrondissements—Orléans, Montargis, and Pithiviers, with capitals of the same name. There are no other large towns in the department, most of the area forming which was before the Revolution included in the province of Orléanais. Area, 2,629 sq. m. Pop. (1954) 360,523.



Loja, Ecuador. Main street of the town of Loja, capital of the province

Loir-et-Cher. Department of France. It takes its name from two rivers that flow through it. The Loire also flows across it; other streams are the Sauldre and the Beuvron. The department is mainly plain or plateau. It contains the district called the Perche,

and part of the Sologne and of the Beauce. Wheat and oats are grown, cattle and sheep are reared, and the vine is cultivated. There are also considerable forests. Blois is the capital of the department and of one of the three arrondissements, the other arrondissements being Vendôme and Romorantin, with capitals of the same name. There are no other large towns. Before the Revolution most of the department was in Orléanais. Area 2,478 sq. m. Pop. (1954) 239,824.

Loisy, ALFRED FIRMIN (1857-1940). French theologian. Born in Lorraine, Feb. 28, 1857, he was ordained priest 1879, and became professor of Biblical exegesis in Paris, 1881; chaplain of the Dominican College at Neuilly, 1894; and director of classics at the Sorbonne, 1900, resigning 1903 upon adverse criticism from Rome. Loisy helped to forward the modernist movement in the R.C. Church, urging that the Church could fulfil its mission in the world by accepting higher criticism and the comparative study of religions. His *Évangiles Synoptiques*, 1907, suggesting that the Gospels failed to give an historical record, brought about his excommunication. He held the chair in ecclesiastical history at the Collège de France, 1909-32. Others of his publications were *L'Évangile et l'Église*, 1902; *La Religion d'Israël*, 1908; *La Morale Humaine*, 1923. He died June 1, 1940. A study by M. D. Petre appeared in 1944.



A. F. Loisy, French theologian

Loja. Southernmost province of Ecuador, S. America. It is bounded S., E., and W., by Peru, and is traversed by the Andes. Rich in minerals, it also has extensive forests of cinchona, the bark of which is exported. Area, 11,000 sq. m. Population (est. 1955) 253,505.

Loja, the capital, at an alt. of 6,850 ft., has a pleasant climate. Founded in 1546, it possesses a cathedral and a law school. Woollens are made. In the neighbourhood are gold, silver, and copper mines; cereals, sugar, cotton, and tobacco are produced, and cattle are raised. Pop. (est. 1955) 23,800.

Loja. Town of Spain, in the prov. of Granada. It stands on the river Genil, 32 m. by rly. W. of Granada. Picturesquely placed at the foot of hills overlooking the

Genil, it has a ruined Moorish citadel, two 16th century churches, and a palace of the dukes of Valencia. It manufactures coarse woollens, leather, paper, and silk, and carries on a thriving trade in cattle and cereals. With Alhama, it formed one of the "two Keys of Granada." It was wrested from the Moors by Ferdinand III, in 1226, but was soon abandoned, to be recaptured by Ferdinand and Isabella, May 28, 1486, through the help of English bowmen under Lord Rivers. Pop. (1950) 30,261.

Lokeren. Town of Belgium, in E. Flanders, a rly junction about 12 m. E.N.E. of Ghent. It is a manufacturing town in the densely peopled and highly productive district of Waesland. The church of S. Lawrence has a famous pulpit by Verhaeghen. Pop. (est. 1955) 26,000.

Loki. A giant in Scandinavian mythology, of a race that reigned before the gods, the personification of fire as a destructive agent. He is beautiful, but cunning and malignant, and swears friendship with the gods in order to ruin them and the world. Through his guile Balder (*q.v.*) was slain. In some myths Loki is chained to a rock, while a serpent drops poison on him. His children are the wolf Fenriz, the earth-serpent, and Hel (*q.v.*).

Lokman (Arab., devourer). The traditional author of certain Arabic fables, which are of Greek origin. He is called the son of Baura, a relative of Job, and is said to have lived for several centuries, and to have known David. Described as a deformed Ethiop slave, Lokman has been identified with the Greek Aesop. One of the chapters of the Koran, in which reference is made to the wisdom of the fable-teller, is entitled Lokman.

Lokrum. See Lacroia.

Lolland. Alternative spelling of Laaland (*q.v.*).

Lollards. Name given in England in the 14th and 15th centuries to the followers of John Wycliffe (*q.v.*). It is derived from the Middle Dutch *lollen*, to sing in an undertone, the name *Lollard* having been applied to the members of an association for burying the dead, founded at Antwerp c. 1300, which, like a similar body, the Beghards, came to be persecuted for suspected heresy. Hence the term was extended in England to those who, under a religious guise, concealed turbulent motives. Some well-known Lollards were more or less independent of Wycliffe's influence; others were simply men who

sought their own salvation in an individualistic way, regardless of the Church, and were sometimes communistic in their ideas. They attacked ecclesiastical endowments, the hierarchy, clerical celibacy, the Mass, and prayers for the dead; charged the clergy with immorality; and denounced capital punishment.

The first English statute against heresy, in the reign of Richard II, was passed by the lords and directed against the Lollards. In 1388 both lords and commons petitioned the king against them, and royal letters urging repression were sent to the archbishops and their suffragans. In 1395 the Lollards themselves presented their case to parliament. In 1401 the statute *De haeretico comburendo* was passed, and whereas excommunication and imprisonment had been the worst forms of punishment for heresy, the civil authorities were now empowered to inflict death by burning upon all offenders handed over to them by the ecclesiastical courts. A prominent victim was Sir John Oldcastle (*q.v.*) in 1417.

Between 1401 and 1532 forty-seven Lollards suffered the extreme penalty. As it developed, Lollardy assumed a social and political character, and was used by courtiers opposed to the political power of the prelates. Generally the Lollards were a poor and unlettered people. Though repressed in both England (especially in London) and Scotland (Ayrshire) by Church and state, they prepared the way to some extent for the Reformation (*q.v.*).

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Lollards' Tower. Place of imprisonment attached to episcopal palaces for those accused of heresy. The tower at Lambeth Palace (*q.v.*), popularly known since the 18th century as the Lollards'



Lollards' Tower. Interior of the prison room in Lollards' Tower, Lambeth Palace, London

Tower, owes this name to a confusion between the archbishop's prison and that of the bishop of London at Old S. Paul's, which is definitely called the Lollards' Tower by Stow. Consult Chapters in the History of Old S. Paul's, W. S. Simpson, 1881.

Löllingite. In mineralogy, essentially iron diarsenide (FeAs_2), occurring as steel-white metallic grains in mineral veins formed at moderate temperatures. It resembles arsenopyrite, but contains a much higher proportion of arsenic and is a richer ore-mineral of that element.

Lolo. Chinese collective name for aboriginal peoples living chiefly in Szechwan, Kweichow, and Yunnan. Calling themselves Nosu, they include the Man and Hsifan tribes. Tall, wavy-haired, hardy hillmen, they comprise the noble Hai (black-bones) and the plebeian Pai (white-bones). Their Tibeto-Burman speech is shared by Lisu, Lahu, and other tribes. They are noted for their fine, often illuminated, MSS., in which the written characters run downwards.

Lomami. River of the Belgian Congo, a southern tributary of the Congo. It runs nearly parallel with the Luabala-Congo, and enters the main stream at Isangi, about 65 m. below Stanleyville. It has not received the attention of explorers and traders, and flows through an unknown section of the country. Lomami is the name of a dist. containing the upper courses of the Lomami and Sankuru.

Lombard, CAROLE (1909-42). American film actress. Jane Peters was born at Fort Wayne, Ind., Oct. 6, 1909, and appeared on the screen from 1926, at first in Mack Sennett comedies. Then she played the blonde adventuress type of part, but in 1936 made a success in "crazy" comedy with *My Man Godfrey*. Later films

included *Nothing Sacred*, 1938; *They Knew What They Wanted*, 1941. She was killed, during a war bond selling tour, in an air crash near Las Vegas, Nevada, Jan. 16, 1942. She married (1) William Powell; (2) Clark Gable.

Lombard, PETER (c. 1100-60). Italian schoolman. Born at Novara, then in Lombardy, he was educated at Bologna and Reims, where he was befriended by Bernard of Clairvaux, and at Paris, where he was a pupil of Abélard. He became a teacher of



Peter Lombard,
Italian schoolman

theology, canon of the convent of S. Victor, and, in 1159, bishop of Paris. He is said to have been the first to obtain the title of doctor of theology in the university of Paris. He is called *Magister Sententiarum* (master of sentences) from his theological manual, *Libri quatuor sententiarum*, *Four Books of Sentences*, collated from the Scriptures and the works of the early Fathers, and designed to explain the whole system of Catholic theology and ethics. Upon this work, which served for a long time as the basis of all theological literature in Europe, more than 4,000 theologians are said to have written commentaries.

The first book treats of God, and brought the author before the Lateran council in 1139 on a charge of heresy, of which he was acquitted; the second, created things; the third, the incarnation, redemption, and human virtues; the fourth, eschatology and the sacraments. He maintained that, until the day of judgement, the inhabitants of heaven and hell will continually see one another, but that in the succeeding eternity the inhabitants of heaven alone will see those of the opposite world. Two other works, a *Commentary on the Psalms* and *Commentaries upon all the Pauline epistles*, are attributed to Lombard, who died in Paris, July 20, 1160. *Consult Life* (in French), F. Protois, 1881.

Lombards. Ancient people of Europe. The Lombards or Langobardi, whose name perhaps means the men of the long axes, were among the last of the Teutonic tribes who forced their way into that part of Europe which had been Latinised by the Roman empire. They lived on the lower Elbe in the 1st century of the Christian

era, but are found four centuries later in Moravia, where they became Arians. They revolted from the Heruli, and subsequently overthrew them in 493.

In the middle of the 6th century, aided by the Tartar Avars (*q.v.*), they extirpated the kindred German people of the Gepidae on the middle and upper Danube, and then, under their king Alboin, burst into N. Italy, 568, and made themselves masters of the whole plain of the Po, making Pavia their capital. Hence the region which they acquired received its permanent name of Lombardy. After Alboin (d. 572) the Lombards were ruled according to ancient tribal customs by many captains or chiefs, who extended their conquests over half Italy as far as the southern duchy of Benevento; a merely nominal sovereignty was enjoyed by an elected king. Catholicism replaced Arianism about 600 through the influence of Queen Theodolinda. There were periods of comparative progress in the time of Agilulf (591-615) and Rothari (636-652), who issued the code of Lombard laws.

From the middle of the 7th cent. till the middle of the 8th cent. Lombard dukes and kings were a perpetual menace to the papacy. The establishment of a real Lombard kingdom of Italy seemed close at hand in the reign of Liutprand (712-43). He established a real authority over the Lombard dukes. A quarrel between Liutprand and Pope Gregory III, and an attack upon Rome, caused the pope to appeal to the Frank Charles Martel against the Lombards, but it was not till after Liutprand's death that Pepin, the son of Charles, answered the papal appeal and set about the subjugation of the Lombards, which was actually completed in 774 by his son, Charlemagne.

The crown of Lombardy became the symbol of the imperial supremacy in Italy, and the Lombard kingdom itself soon disappeared. In the later Middle Ages the name of the Lombards, still preserved in Lombard Street, was given to the Italians who took the place of the expelled Jews in providing the crown with financial support. *Consult Italy and her Invaders*, T. Hodgkin, 2nd ed. 1892-96.

Lombard Street. A London thoroughfare, running from the Bank of England to Gracechurch Street, across which it is continued by Fenchurch Street. It contains the Wren church of S. Edmund—another of his, All Hallows, has

been removed under a replanning scheme—and S. Mary Woolnoth, built by Hawksmoor. Off Lombard Street are George Yard and Plough Court, where a tablet records that Pope was born. The street obtains its name from the Lombards who settled here as early perhaps as the 12th century. They were money-lenders, and this association has been kept up, many of the great British and foreign banks having their offices here. Lombard Street is often used as a synonym for the London money market. It is also the title of a classic work by Bagehot, 1873.

Lombardy (Ital. Lombardia). One of the regions of N. Italy. It borders the Swiss cantons Grisons and Ticino, and contains the valley of the Po from the Rhaetian Alps in the N., between Piedmont and Venetia, to Emilia in the S. It embraces the provs. of Bergamo, Brescia, Como, Cremona, Mantua, Milan, Pavia, Sondrio, and Varese. Except in the N., where it is mountainous, the surface is virtually a fertile and well-cultivated plain. The division is well watered by the rivers Po, Adda, Oglio, Ticino, etc., and is well canalised and irrigated. Lake Maggiore is on the W. boundary and Lake Garda lies on the E. frontier. The beautiful lakes of Como and Isco are wholly within Lombardy. The climate is very hot in summer and cold in winter. The chief productions are iron, copper, zinc, marble, granite, and alabaster.

Silk is largely manufactured, and the mulberry tree cultivated, while rice, maize, flax, hemp, wine, fruit, and nuts are grown. The chief town is Milan.

Lombardy was named after the Lombards (*q.v.*), who wrested it 568, from the E. Roman empire. Conquered by the Romans 222 B.C., it had been part of Gallia Cisalpina or Transpadana. The Lombard cities, which grew rich by industry and trade, formed small republics and joined the Lombard league, which successfully stood out against the emperors. By the close of the Middle Ages Lombardy came under the rule of the dukes of Milan. It later fell under the sway of Spain, and then of Austria. It was taken from the latter in 1859 and made part of the kingdom of Sardinia, and two years later was incorporated in the new kingdom of Italy. Area, 9,183 sq. m. Pop. (1951) 6,504,738.

Lombardy Poplar (*Populus italica*). Tall-growing tree much used for ornamental purposes. It is of hybrid origin, one of the parents

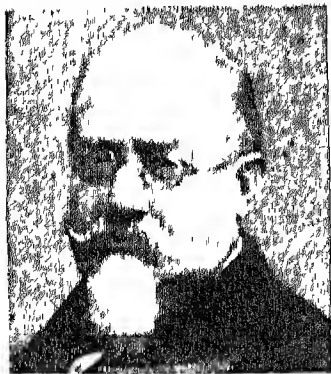


Lombardy Poplar in winter, showing vertical direction of branch growth

Lombok. Island of Indonesia. In the Sunda group, it is separated from Sumbawa on the E. by the strait of Alas and from Bali on the W. by the strait of Lombok. Two mountain chains extend along the S. and N. coasts, in the latter of which is a volcanic peak, Mt. Lombok, 12,379 ft. high. Between the mountains is a fertile valley in which rice, maize, and coffee are grown, and cattle and horses raised. The capital is Mataram and the principal port Ampanam, on the W. coast. The island exports cattle, horses, tobacco, and indigo. Lombok, under Dutch control in 1894, was governed by a rajah through the Dutch resident of Bali and Lombok until occupied by the Japanese, 1942-45. It is part of the republic of Indonesia.

Lombok, STRAIT OF. Channel separating Lombok from Bali, Indonesia. Although at its narrowest only 22 m. wide, and in places only 1,020 ft. deep, it also separates Asia from Australasia as regards flora and fauna, a fact discovered by A. R. Wallace (*q.v.*).

Lombroso, CESARE (1836-1909). Italian criminologist. Born Nov. 18, 1836, he became an army surgeon, 1859; professor of mental diseases at Pavia university, 1862; later professor of forensic medicine and psychiatry at Turin. In 1875



Cesare Lombroso, Italian criminologist

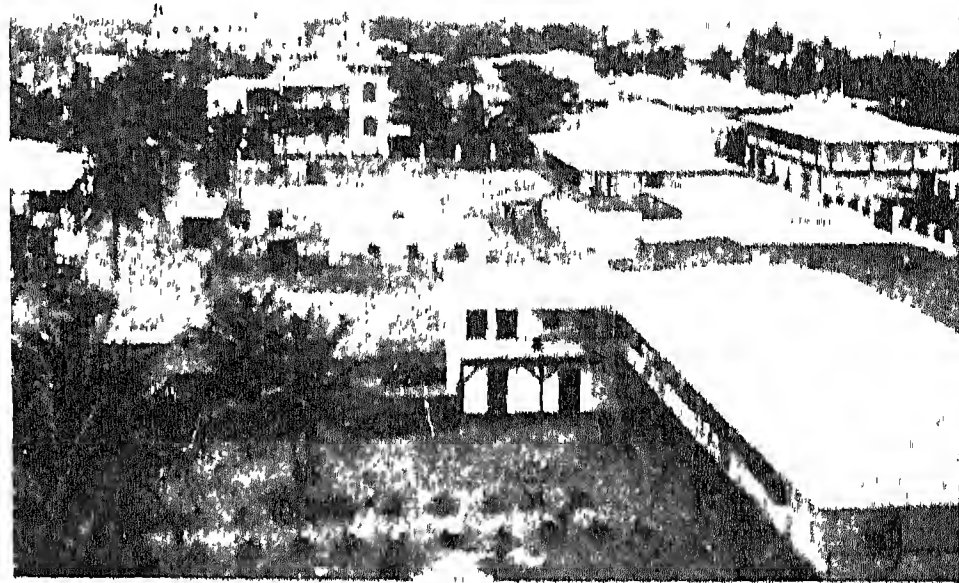
he published his monumental work *L'Uomo Delinquente* (The Criminal), in which he promulgated the theory that there was a definite criminal type which could be distinguished from the

normal type both anatomically and psychologically. Other books include *The Man of Genius* (Eng. trans. 1891); *Crime, its Causes and Remedies* (Eng. trans. 1911). He died Oct. 19, 1909. See *Criminology*; consult *Life*, H. Kurella, Eng. trans. 1911.

Lome. Seaport of French Togoland. Under the German administration before the First Great War, it was the capital of the country. Situated in the extreme W. of the colony, on the Bight of Benin, it is connected with Atakpame by rly., and also by rly. along the coast with Aného. The port has a wharf which can take a daily traffic of 600 tons. Lome was captured from the Germans by a British force on Aug. 7, 1914. Pop. 27,908.

Lomond. Scottish loch or lake. It covers 27 sq. m., but has a length of 23 m., the breadth being mostly one mile and only at one point 5 m. The largest inland loch in Scotland, it is often called the most beautiful. Its extreme length is between Ardlui and Balloch. It lies between Stirlingshire and Dumbartonshire, amid

Lomond. At Inversnaid coaches from the Trossachs connect with the steamers on the lake. The romantic associations of the district inspired a celebrated song. Around Balloch its shore has been industrialised; at Inveruglas, on the western shore of the lake, a power station of the N. of Scotland hydro-electric board's Loch Sloy scheme came into operation in March, 1950. See Ben Lomond.



Lome, West Africa. European quarter of this seaport town of French Togoland

Lomza. Town of Bialystok, Poland. In the 16th cent. it had a trade with Prussia and Lithuania. In 1795 it came under the dominion of Prussia, and after the peace of Tilsit (1807) it was under Russian rule until 1918. It lay in Russian-occupied Poland after the partition of 1939, was overrun by the Germans in 1941,



Loch Lomond, Scotland. View of the loch looking eastward from Luss

mountain and other scenery of great beauty. In the lake are a number of wooded islands. It receives the Endrick, Luss, Arklet, and other streams, and its waters pass by the Leven and the Clyde to the sea. On the E. side is Ben

and recaptured by the Russians after bitter fighting, Sept. 13, 1944. It stands on the Narew, a tributary of the Bug, 80 m. N.E. of Warsaw, on a branch of the Leningrad-Warsaw rly. Trade is carried on in corn, timber, and tar.

LONDON: THE WORLD'S LARGEST CAPITAL

W. ERIC JACKSON. Assistant Clerk to the London County Council

Here is an account of the history and activities of the capital of Great Britain, including particulars of the effect on that city of the air raids it suffered during the Second Great War. Elsewhere in this work are hundreds of articles concerned with the boroughs, districts, parks, squares, buildings, monuments, etc., of the metropolis, e.g. Bankside; Lambeth; Kensington; Westminster; Hyde Park; Trafalgar Square; Guildhall; Law Courts; Tower, The, etc. See also Great Fire and biographies of eminent Londoners: Defoe; Dickens; Hogarth; Milton; Pepys, etc.

The name London has many meanings. In the popular sense it includes the vast inhabited area which stretches from Kew to Barking, from Surbiton to Enfield, and even beyond. When the registrar-general, for statistical purposes, first devised the

term "Greater London" he took the metropolitan police and city police districts which together form an area more or less within a radius of 15 m. from Charing Cross. That term has since become popular and expresses a recognition that this great area is, in many senses, one unit. Greater London, in fact, comprises the whole of Middlesex and parts of the cos. of Essex, Kent, Surrey, and Hertford, has an area of 693 sq. m., and a pop. (1951) of 8,346,137. The built-up sprawl into which the original London has expanded has not ceased at the boundary of "Greater London" so defined, the plan issued in 1944 including an even wider area.

The present City, 675 acres in area (pop. 5,268 in 1951), is the original London dating from Roman times. It lay within the city wall, with the Ludgate in the W., Aldgate in the E., Aldersgate in the N., and the Thames as its

S. boundary. In contemporary speech the name London is more appropriately applied to the administrative co. of London, formed in 1889. This contains about 118 sq. m., with a pop. (1951) of 3,348,336, and includes the city. Outside the city, the co. is divided into 28 met. bors. London is divided into 43 bor. constituencies, one of which is the City, the city of Westminster, and the Inner and Middle Temple.

The London postal area is larger than the co., although it does not contain some small parts of Woolwich and Lewisham. It is divided into eight districts, which in turn are divided into a total of 118 separate delivery areas. For the purpose of main drainage, electricity supply, and water supply other special areas have been defined, each differing from the others and each larger than the co.

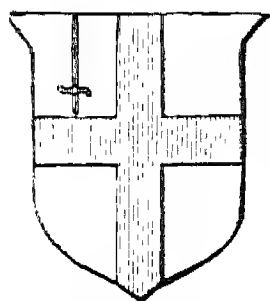
GEOLOGY AND GEOGRAPHY. The primary factor which has determined the importance of London is its position at the head of the Thames estuary, the main gateway into Britain from the Continent. Medieval chroniclers attribute the foundation of London to legendary heroes of prehistoric ages, but from archaeological and historical evidence there is little doubt that before the first cent. A.D. the site of London was a marshy tract merging on the higher ground into primeval forest, and that the main crossing of the Thames used by the Romans was at or near the site of the present-day London bridge. South of the river most of the land

in the London area is low-lying. Because of its marshiness it was little built on until the 19th cent. N. of the river the ground rises fairly sharply, excepting where streams ran down from the Hampstead heights. The Westbourne flowed through what is now Hyde park to its outlet at Chelsea; the Tyburn ran a little to the west of Bond St., across Green Park, and into the Thames by two branches at Westminster; the course of the Holbourne was by King's Cross, along the line of Farringdon St. under what is now Holborn viaduct, the lower reaches being called the Fleet. To the E. the river Lea still empties itself by many mouths into the Thames.

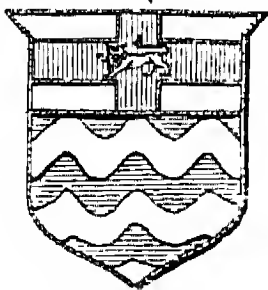
London lies within the chalk basin which extends from S. Herts. to the North Downs of Surrey and Kent. The basin is overlaid by a deposit of London clay which, in its turn, has been covered in part by local deposits of river gravels. These gravels form a clean, dry metallurgical eminently suitable for habitation.

EARLY HISTORY London is in origin two cities, the City of London, from its foundation in Roman times a trading centre, and the city of Westminster, which grew up slowly round the royal palace of Westminster. Both "cities" grew until their buildings joined, but throughout the cents. their main characteristics have been retained. The City of London is the centre of commerce, Westminster, "the west end," is the main shopping and entertainment quarter and the seat of govt.

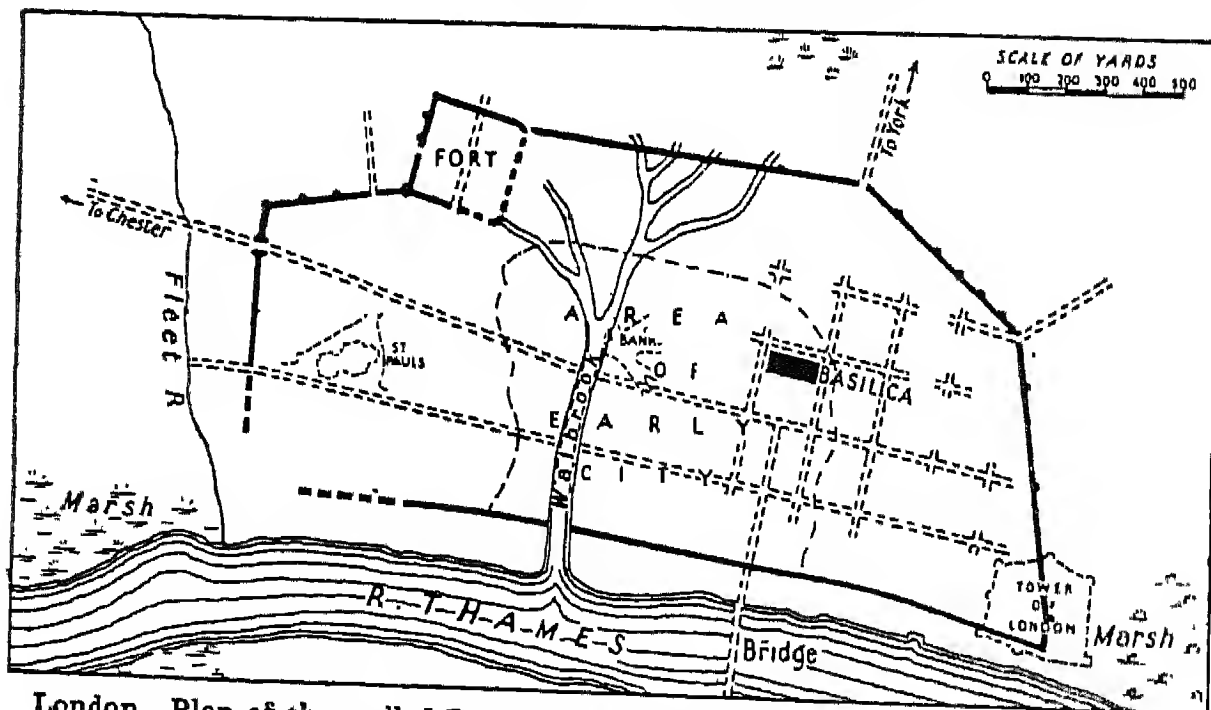
Tacitus tells us that Londinium was already a flourishing community when in A.D. 60 it was destroyed by Boadicea and her tribesmen. It was soon rebuilt by the Romans and was defended against further attack by a wall, portions of which still remain to mark the bounds of the Roman city, e.g. in the Tower, in the churchyard of S. Giles, Cripplegate, and in the street now called London Wall. After the withdrawal of the Romans in A.D. 410, Britain was subjected to waves of invasion by Germanic tribes who knew nothing of urban civilization. Life ebbed from London



City of London arms



County of London arms



London. Plan of the walled Roman city, showing known features. The dotted indications of St. Paul's, the Bank, and the Tower give its extent

and its buildings fell into decay, but it is unlikely that it was completely deserted. It must have recovered some of its former importance by the beginning of the 7th cent., for in 604 Mellitus was consecrated bishop of London.

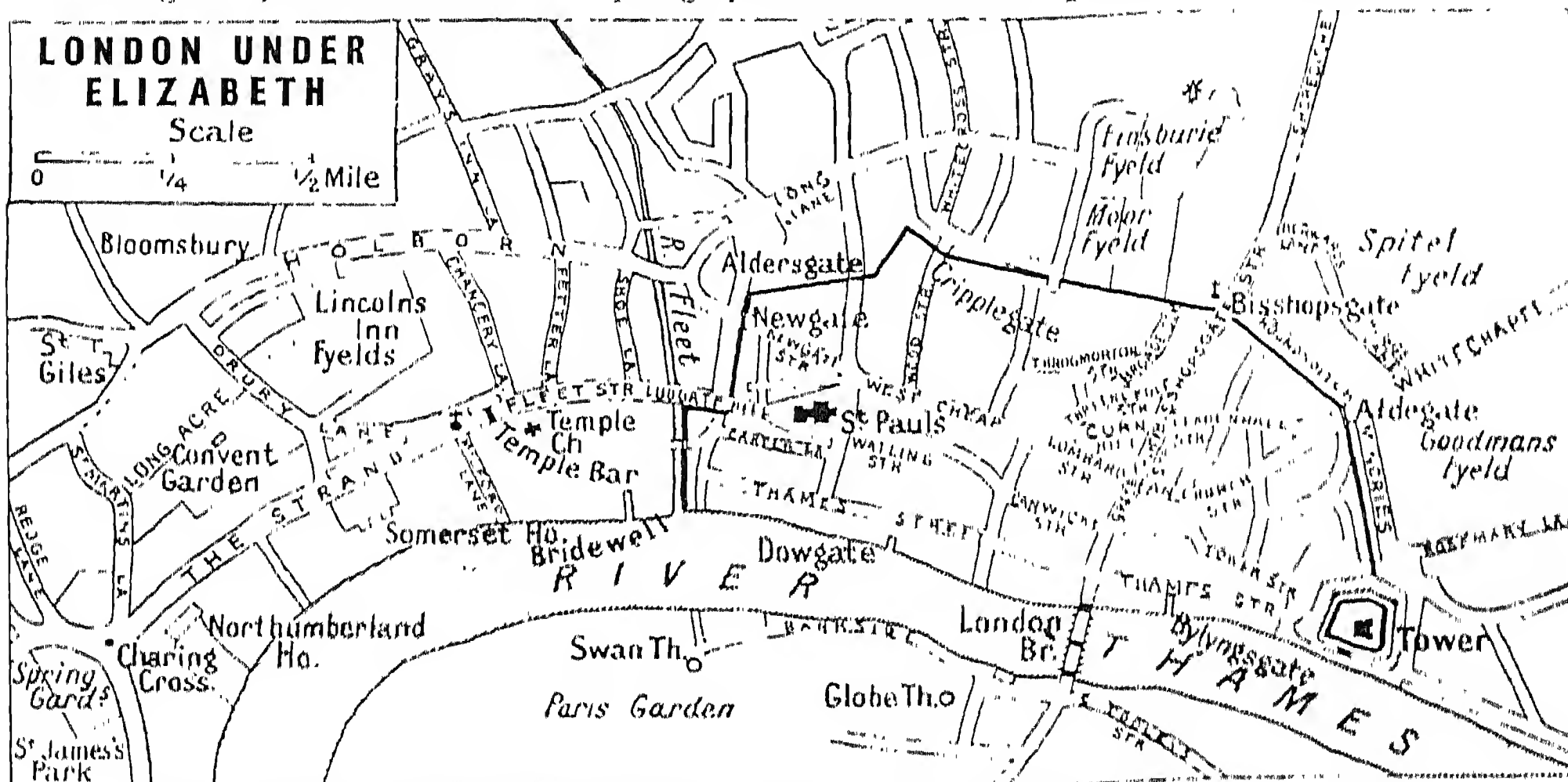
During the wars against the Danes, London, once more a trading centre, was a bone of contention. It seems to have been the centre of govt. when Canute became king of England. The abbey of Westminster, founded probably in the 8th cent. on the Isle of Thorney well outside London, was rebuilt by King Edward the Confessor, who also built a palace for himself close by. His successor, William the Conqueror, realizing the strategic importance of the

had secured a firm hold over commercial matters and over the administration of City govt. They developed into the livery companies, many of which survive. Sir Richard Whittington typifies the wealthy City merchant of the 14th-15th cent.

Westminster increased in importance after the establishment of the law courts there under Henry II. Gradually the great offices of state, the Exchequer, and the Chancery, and their offshoots, became centred there, and in the later Middle Ages when parliament was increasing in importance it too made Westminster its normal meeting place. By the end of the 15th cent. a collection of buildings had sprung up round Westminster

done by S. Bartholomew priory and Bermondsey abbey.

ELIZABETHAN AND STUART LONDON. The outburst of energy which followed the Renaissance, the popularity of Elizabeth I, and the brilliance of her court brought renewed vigour to England's capital. Noblemen, who previously held their town residences in the City, built houses at Westminster where they were nearer the royal court and had more room than in the crowded City streets. The wealthier merchants began to follow their example, and the sovereign became alarmed at the spread of buildings. The growth of a large town was a new phenomenon which might have serious political consequences, and it pro-



London. Plan showing main thoroughfares in the late 16th century, based on maps by Stow and Aggas

conjunction of Westminster and London, had himself crowned in the abbey, and made Westminster palace his chief residence. William built the White tower, the core of the present tower of London, to overawe the citizens, but in some degree reconciled them to his mastery by granting them a charter of liberties.

MEDIEVAL TIMES. During the Middle Ages London grew in wealth and importance and overflowed beyond the ancient walls so that some of its wards lay without the City gates, and new bars or gates were built to mark their limits. Temple Bar and Holborn Bar marked the W. boundary and the citizens tried to assert their rights over the growing community at the S. end of London bridge in Southwark. As in other towns, merchant and trade guilds were formed. By the 14th cent. they

palace. These housed govt. officials and clerks and provided lodgings for courtiers and M.P.s.

Henry VIII and Cardinal Wolsey did much to change the face of London. They built Whitehall, St. James's, and Greenwich palaces, and to them Hyde park and St. James's park owe their origin. They dissolved the numerous religious houses existing in London. Some of the buildings were destroyed, but some were adapted for secular, parochial, or charitable uses. The priory church of S. Mary Overy became the parish church of S. Saviour's, Southwark (now Southwark cathedral). Schools were founded at Westminster, S. Paul's, Greyfriars (Christ's Hospital), and elsewhere; while the hospitals of S. Bartholomew and S. Thomas were founded in the reign of Edward VI as a part replacement of the charitable work

directed many difficulties in the provision of sufficient food and water and sanitation. Elizabeth and James I issued edicts against further building, but they were powerless to stem the tide. London's pop. was growing, and it had to be housed. Nevertheless, the first authentic map of London made about 1570 shows the churches of S. Martin and S. Giles still "in the fields." It was not until the middle of the 17th cent. that Leicester Sq. and the neighbouring streets were laid out by the earl of Leicester on the site of Leicester house, and that the piazza was built in Covent (or Convent) Garden by the earl of Bedford. John Stow in his Survey of London, first ed. 1598, gives a detailed and vivid description of London in a period of rapid change and development.

The citizens of London opposed the demands of Charles I for loans

and taxes and supported parliament against him in the Civil War. Soon after the restoration they suffered two severe calamities—the Great Plague and the Great Fire. The result was an impetus to the spread of London. Many people fled from the tainted air of the City to the surrounding villages in 1665, and, although Sir Christopher Wren's spacious rebuilding scheme for London after the fire was not adopted, many of the congested alleys were cleared, and the new houses were less tightly packed than the old, the displaced pop. finding accommodation outside the City.

A City of Spires

Wren made London a city of spires, many of which have fortunately survived both "improvers" and enemy attacks. His greatest monument is St. Paul's cathedral, which, though damaged by enemy bombs during the Second Great War, still supports the great dome, to many people a symbol of London's greatness.

17TH, 18TH, and 19TH CENTURIES. The discovery of the new world and the opening of routes to the East meant a great increase of trade in London. The new trading companies—the merchant adventurers, the Muscovy co., the E. India co., the Hudson's Bay co., etc.—had their h.q. there. The river quays grew busier, but it was not until 1800 that the first dock, the W. India dock in the Isle of Dogs, was built.

The guilds and livery companies, originally democratic in character, tended to become more exclusive and oligarchical as they grew richer. Poor craftsmen were often forced to leave the City, either because of the high cost of living or because of the restrictions imposed by the guilds. They plied their trades in the suburbs and sold their wares to the City shopkeepers. They were joined by craftsmen from other parts of England and, particularly in the 16th and 17th cents., by refugees from persecution on the Continent. French silk-weavers settled in Spitalfields and Shoreditch, feltmakers from Rouen and hop-dealers from Flanders settled in Southwark, tanners in Bermondsey.

The poorer workers who made their abode outside the City either crowded into existing houses or put up makeshift sheds and hovels. Simultaneously a more orderly growth of London was taking place. Landowners were "developing" their estates W. of the City with the aid of the speculative

builder, and streets and squares of houses were being built to accommodate the nobility, the City merchants, and the new professional classes. Many of these flat-fronted brick Georgian terrace houses still survive, particularly in Westminster and Bloomsbury.

The London bridge, built at the beginning of the 13th cent. by Peter de Colechurch, survived, though with many repairs and alterations, until 1831 when the present bridge was opened. No other bridge was built over the Thames in the London area until the first Westminster bridge of 1750. The first Blackfriars bridge was completed in 1769. Approach roads to these two bridges were formed on the S. side of the river, converging at St. George's Circus, but little building took place between them except along their immediate frontages. The area between Blackfriars Rd. (formerly Great Surrey St.) and the Borough was, however, almost all built over by the end of the century.

In the years following the industrial revolution London, like the rest of the country, had a rapidly increasing pop., though from 1785 onwards hundreds of London pauper children were sent N. to work in the factories. The speculative builder was busy both building round the central area and developing the villages surrounding London—Islington, Hackney, Poplar, Greenwich, Camberwell, etc.—until they converged into the urban agglomeration now called London. Even marshy land like that in Pimlico and Lambeth, previously considered unfit for building, was drained and built on. Street upon street of uniform semi-basement houses was built to accommodate the large families and plentiful domestic servants of Victorian London, the London of extremes of wealth and poverty, of bustle and confusion ill-drained, and often fog-bound, but full of vitality, admirably portrayed in the novels of Charles Dickens.

Outbreaks of Cholera

The public health conditions in London were, as were those of other great cities at this time, deplorable. The tainted and inadequate water supply, the slums and cesspools, and the festering graveyards resulted in outbreaks of cholera in 1832-33, 1848-49, and 1853-54, which spread from the poorer to the richer quarters of the town.

The social conscience was awakened. The reforming zeal

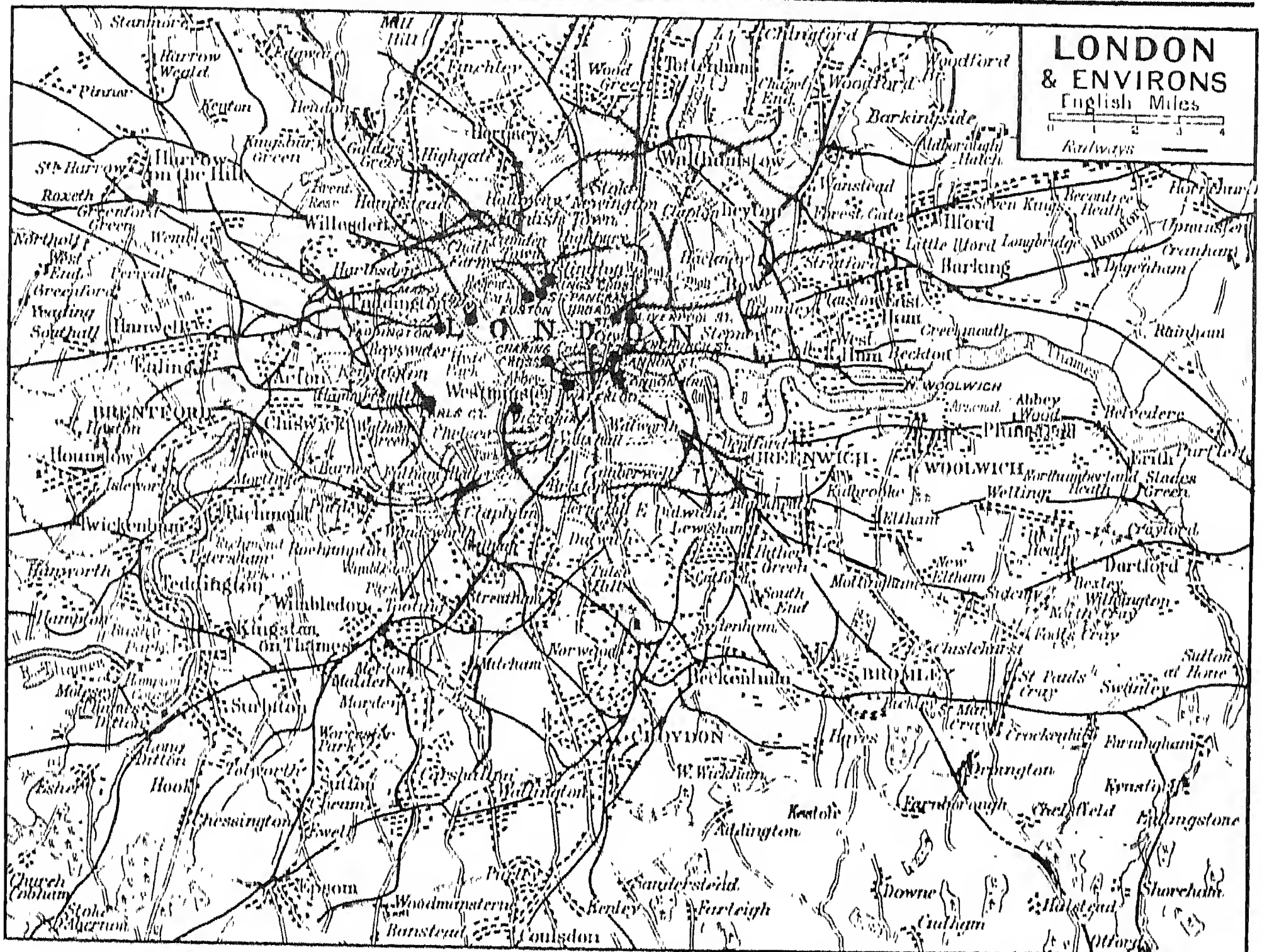
engendered throughout the country in the latter part of the 19th cent. had an impressive impact upon London's local govt. Twice at least in that half-cent. the organization of local administration in London was drastically overhauled.

THE CITY CORPORATION. Of the authorities sharing the local govt. of London, the City of London corporation is the most ancient. The earliest London officials recorded are the bishop and the portreeve, mentioned in the charter given to the City by William the Conqueror. The portreeve was apparently the representative of the civil authorities. His office appears to have been abolished and his place taken by the sheriff or shire-reeve, appointed by the king. Londoners were, however, granted by Henry I the unusual privilege of appointing the sheriffs of London and Middlesex (in which co. London then was). This privilege was forfeited in the reigns of Henry II and Richard I, but restored by John in 1199.

History of the Mayoralty

At a somewhat earlier date a new official appears to have been created the mayor. His office dates certainly from 1191 and probably from some years earlier. John, during the absence of his brother Richard I, granted to the citizens of London the right to elect their own mayor. The conferment of this right was the price of the citizens' support of John against the justiciar Longchamps. John swore to recognize the London commune, a form of town govt. borrowed from Rouen. Under this system the local governing body was the mayor and 12 *echerins* (aldermen) with whom were associated *alii probi homines* (other worthy men), also to the number of twelve. Thenceforward the mayor was the head of London's local govt.

Somewhere about 1540, without any official grant of the title, the mayor became the lord mayor. The *echerins* and the "other worthy men" were forerunners of the present common council. Aldermen had already, from an early date, presided over the 25 wards into which the City was divided. Their earliest appearance as a court of aldermen was in the 13th cent. From the 14th cent. onwards the City corporation thus included the chief magistrate (mayor), a court of aldermen, and a court of common council. The annual election of aldermen was formally ordered in 1377. The common



London. Map of Greater London, showing the vast area it had attained by the 1950s

councilmen were originally elected by the wards, but by the close of the Middle Ages their election was made by the livery companies. Both aldermen and common councilmen are now popularly elected on a franchise similar to that for other local govt. elections. In 1683 Charles II in his attempt to obtain autocratic power deprived the City of its civic liberties, but they were restored in 1698.

The court of common hall consisted originally of all freemen of the City. Later it became representative of the wards. It consists today of those freemen of the livery companies who are entitled to the "livery" of their companies; it elects the two City sheriffs and certain other officers, and nominates two aldermen for the office of lord mayor from among those who have been sheriffs. The court of the 25 aldermen now elected for life, one for each ward, acts as a court of justice for minor offences (each alderman being a J.P.) and has the control of the City of London police force. The court of common council is composed of the aldermen and 207 common councilmen elected annually. This court is virtually the

local govt. authority for the City and carries out duties relating to public health, housing, open spaces, streets, and bridges.

The lord mayor presides over all three courts of which the corporation is composed. He is the chief magistrate, has the title of admiral of the port of London, has certain duties in connexion with the royal coronation, and has a number of other functions and privileges. After his election he is presented to the sovereign by the lord chancellor for the royal approval, and is then sworn in by the judges of the high court. This is the occasion for one of London's most popular events, the procession to the law courts, known as the lord mayor's show, held on or about Nov. 9 each year, usually in the form of a display of pageantry illustrative of some aspect of London life or some theme of current public interest. The City of London corporation, largely medieval in form, is a unique local governing body.

Apart from income from rates, the corporation has substantial private property, the funds from which are used for charitable and educational purposes, ceremonies and the entertainment of distin-

guished visitors, and the official salary of the lord mayor. The corporation officials, besides including normal local govt. appointments such as M.O., engineer, surveyor, and solicitor, include also the recorder, appointed for life by the lord chancellor on the nomination of the City. The recorder acts as one of the judges of the central criminal court. The common serjeant is a somewhat similar appointment. The town clerk is elected annually. The chamberlain is by ancient custom the treasurer of the City. The remembrancer has duties connected with official hospitality and the maintenance of relations between parliament and the City. The secondary keeps the register of electors.

The sheriffs of the City lost their jurisdiction over the co. of Middlesex when in 1889 the co. of London was created.

THE COUNTY OF LONDON. Before the middle of the 19th cent., in the area surrounding the City, local govt. was partly in the hands of the quarter sessions of the various cos. Each parish had either an annual vestry composed of all the local inhabitants, or a select vestry set up, under the Vestries

Act, 1831, as representing the inhabitants. These vestries had very limited powers. Accordingly, in order to deal with such matters as sewerage, street maintenance, and paving, special bodies were set up under acts of parliament to provide these necessary services in defined localities. By 1855 there were some 300 of these small bodies in the met. area. Numbers of them were in no way responsible to the local ratepayers. The Metropolis Management Act, 1855, defined an area to be known as the metropolis, and in that area abolished these small local bodies and set up administrative vestries elected by the local ratepayers. Some of the smaller parishes were grouped together under elected district boards. These vestries and district boards were given the functions of street management, sewerage, drainage, and the like. For the metropolis as a whole, a met. board of works was set up, not directly elected by the people, but appointed by the local vestries and boards. The met. board had certain general functions over the whole area, such as the management of the London fire brigade, main drainage, the Thames embankments, and the administration of the London building laws.

London Made a County

The met. board of works proved unpopular, chiefly because of its indirect election. Complaints of maladministration and corruption were made. A royal commission was appointed to make inquiry. By the Local Government Act, 1888, which set up C.C.s throughout England and Wales, the "metropolis" was made a co. by itself, and the London county council was created. The co. has its own sheriff and lord lieutenant. For local govt. purposes the City of London is part of the administrative co. of London. For judicial purposes the City remains a separate co. with its own sheriffs.

By 1899 the vestries and district boards were supplanted by the met. bor. councils, 28 in number, of which one (Westminster) has the title of city council. Each of these has a mayor, aldermen, and councillors. The councillors are publicly elected by the local residents every three years. Aldermen are, in number, one sixth of the councillors, and are elected by the councillors every six years. The total membership of a met. bor. council may not exceed 71.

The L.C.C. consists of councillors (numbering 126 in 1955) elected for three years, and aldermen (21) appointed by the coun-

cillors who sit for six years. There is a chairman, a vice-chairman, and a deputy chairman. The council is responsible for certain main services, such as public education, main drainage, major housing schemes, town-planning, the London fire brigade, and a number of large parks and open spaces. The City corporation and the met. bor. councils administer local services such as public libraries, baths, cemeteries, refuse collection, minor housing schemes, public gardens, food sampling, and street maintenance.

Authority Managing the Port

The management of the port is in the hands of the port of London authority, which is partly appointed by the govt. and local authorities, and partly elected by users of the port. Water supply in and around London is managed by a special water authority, and police services outside the City and within an area extending some 15 m. from Charing Cross are under the control of a commissioner of police for the metropolis, who in turn is subject to the supervision of the Home office.

TRADE AND INDUSTRIES. Besides being a national and imperial capital and a governmental and administrative centre, London is a hub of commerce and an area of very considerable industry. The greatness of London has, indeed, been founded upon commercial activity. The livery companies developed out of guilds which were chiefly concerned with crafts and local trade, but they soon became divided into those which catered for local demand and those which undertook international trade. Of the latter class the mercers were the most prominent, and from their co. the great merchant adventurers co. evolved, the first of the many important trading companies which assisted in the development of the resources of the new world. The first royal exchange was built in the reign of Elizabeth, and provided a tangible sign of the growing importance of London trade. Until then merchants had been obliged to meet in the streets to transact their business or (at a later stage) to make use of the converted nave of St. Paul's as a sort of general meeting place.

The great increase in the number of banks during the 17th cent. illustrated the growing prosperity and commercial activity of London. These banks were in the hands of the goldsmiths, who, in the 16th cent. had taken the place of the Lombard and other foreign bankers

of the Middle Ages. The great event which marks the beginning of the era of London's modern trade, however, was the foundation of the bank of England in 1694. From this time onward London tended to become a world centre for trade. The 18th cent. saw terrible financial crises, the worst of which was the bursting of the South Sea Bubble in 1720. These were, however, temporary checks in a steady development.

The Crystal Palace exhibition of 1851 marked one of the peak periods of London's prosperity. The exhibition was held in Hyde park, the building being subsequently moved to Sydenham. It survived until 1936 when it was destroyed by fire. None of the subsequent "great exhibitions" at Earl's Court (1894), the White City (1908-10), and Wembley (1924-25) aroused quite the same enthusiasm.

Industrial Development

At the beginning of the 20th cent. London had a world wide importance not only in commerce but also in industry. Within the co. of London in 1938 approx. three-quarters of a million persons were engaged in productive industry. Some 37,000 factories and workshops were in operation. The principal industries were (in order of size) engineering, clothing, food (including tobacco and drink), furniture, printing and paper, and chemicals, besides a large number of miscellaneous trades. Engineering and clothing in 1938 accounted for some 55 p.c. of London's industrial employment, and 60 p.c. of its factories and workshops. The Second Great War (1939-45) with its air-raid damage did not greatly alter this balance. There is a tendency for industry to decentralise from the congested inner areas to the outer belt, a process encouraged by the various town-planning proposals. This, however, may be regarded as a spreading of London rather than as a diminution.

The average number of workers per factory, except for a few relatively large ones, is less than 20. Industry is for the most part small-scale and very scattered, although engineering works of no small importance are to be found on both sides of the river. The royal arsenal at Woolwich is a particular example. In the same bor. and in Greenwich, Deptford, Poplar, and Battersea heavy engineering is organized in large units undertaking the manufacture of cranes, boilers, cables, marine engineering, and ship repairs. There

is a certain amount of shipbuilding of smaller craft. Medium and light engineering, including the production of printing machinery, electrical and household equipment, pressed metal work and scientific instruments, is distributed throughout the co.

The Clothing Trade

Clothing manufacture and tailoring is chiefly grouped in two areas, the west end (the centre of fashion) and the east end (the main centre of wholesale, warehouse, and mass-produced trade). Much of the "tailoring-out" work for the high class west end tailors is done in Soho, some of it in the east end. The centre of the west end dress-making trade is Regent St., Bond St., and Brook St., while Oxford St. is the shopping centre for the less expensive retail drapery and women's clothing. In Hanover Square and Soho Square is the wholesale dressmaking business. The east end wholesale trade is linked with the City warehouses, but some high quality specialised work is also carried out. The boot and shoe industry lies chiefly in Hackney. The fur trade is located in Stepney, Bethnal Green, and Hackney in association with the fur warehouses of the City.

Food manufacture and allied processes, such as bacon curing, butter blending, sugar refining, tobacco processing, and brewing, form a very substantial part of London's industry. The furniture making trade is located chiefly in the east end, as an overspill from the City, and is carried on in both small and large workshops. A trade in repair work is developing in the west end mainly in association with the big shopping centres and the antique furniture trade.

The printing industry continually expands. An important section of this trade is the production of daily newspapers and other periodicals and the subsidiary trades, such as process work, ink making, and general stationery.

The heavy chemical industry in and around London is largely outside the boundary of the co., but there are in the co. substantial factories concerned with oil refining, paint, soap, glue, and gas manufacture. A great development has taken place in the light chemical industry concerned with cosmetics, tooth-paste, surgical requisites, and the like.

In the period between the First and Second Great Wars industry, particularly light industries, tended to gravitate towards London. The Town and Country

Planning Act, 1947, and other acts, and town-planning schemes made under them, had as one of their objects the establishment of satellite towns, with an appropriate amount of industry, some 20 to 50 m. out from London, in order to relieve the congestion of London and provide better living conditions there.

The backbone of London's industry is the port of London with the majestic easy-flowing Thames leading right into the heart of the city, and London's long pre-eminence as a port is likely to continue. The port has a tremendous entrepôt trade and is a supply centre for London region.

Of the wholesale markets Covent Garden, where fruit, vegetables, and flowers are sold, is perhaps the most famous. Smithfield is the principal market for meat, Billingsgate for fish.

The London stock exchange is the leading exchange of its kind in the country. Lloyd's is the centre for world marine insurance. The Fleet St. area contains many newspaper and publishing offices.

AMENITIES AND SOCIAL LIFE. Since the days of Shakespeare and the theatres on Bankside, London has been the mecca of British actors. Most of the theatres are in the neighbourhood of Charing Cross Rd. and Shaftesbury Ave. Cinemas are numerous and vary in size from the super cinema (some of which were specially built and some converted from former theatres) to the small news theatre of which examples are found at main line rly. termini. Important films are usually shown in central London before being generally released. Queen's Hall, home of the promenade concert, was destroyed, and the Old Vic, resort of lovers of Shakespearian and other classical drama, was damaged by air raids in 1941; the "proms" found a home in the Royal Albert Hall. Development of the South Bank, started for the 1951 Festival of Britain by the building of a permanent concert hall, continued thereafter.

Art Collections and Libraries

The chief picture galleries are the National and the National Portrait galleries in Trafalgar Square, the Tate gallery (mainly 19th and 20th cent. paintings) on Millbank, and the Wallace collection in Manchester Square. The Victoria and Albert and the British museums contain large collections of drawings and etchings. S. Kensington is the museum centre of London. The London

museum (*q.v.*) was housed at Kensington Palace from 1918.

The British museum library, one of the three copyright libraries, contains over 5 million books and a large collection of manuscripts; the newspaper section was moved to Colindale, 1932. It attracts many students, as does the public record office. Other fine libraries are the science library in the Imperial Institute, the law libraries in the Temple, the library of the London school of economics and political science, and the libraries of London university and its colleges. Many learned societies have their h.q. in London.

London's Open Spaces

The royal parks, Green park, Hyde park, and Kensington gardens, form a continuous stretch of open space over two m. long. The rose garden, the lake, and the open-air theatre attract many visitors to Regent's park. The parks at Dulwich, Battersea, and Finsbury Park are among the most attractive of those maintained by the L.C.C. Open-air entertainments and bands are provided in the summer months. Epping forest, Hampstead heath, Richmond park, and Wimbledon common are large open spaces where natural conditions have been retained. Transport to the open countryside is available by bus, motor coach, and rly. The local authorities have done much to preserve "London's country" by buying up tracts of land round the built-up area to form a green belt round London.

Thousands of people visit London every year to see cricket at Lord's and the Oval, tennis at Wimbledon, Rugby football at Twickenham, and Association football at Wembley. Other important sporting events take place at Wembley stadium, the White City, and in the Crystal Palace grounds.

The fashionable shopping centre is the neighbourhood of Regent St., Piccadilly, Bond St., and Oxford St., though Knightsbridge and Kensington High St. attract many shoppers, and none of the bors. is without its local shopping centre. Certain trades and types of shop tend to collect in certain streets, *e.g.*, Charing Cross Rd. is noted for its bookshops, Great Portland St. for motor salerooms. Street markets flourish in The Cut in Lambeth, Middlesex St. (formerly Petticoat-lane) in Stepney, Berwick market, Soho, and many other parts.

Westminster abbey, S. Paul's cathedral, and Southwark cathe-

dral attract visitors. S. Martin-in-the-Fields is perhaps the best known of London's parish churches. Westminster cathedral, off Victoria St., and Brompton oratory are the centres of Roman Catholicism. Many churches and chapels were destroyed or badly damaged by enemy air attack in 1940-41 and 1944-45, but the Central Hall, opposite Westminster Abbey, the Memorial Hall in Farringdon St., and Friends' House, Euston Rd., remained as the central meeting places of the Methodists, the Congregationalists, and the Society of Friends. The Salvation Army h.q. in Queen Victoria St. was destroyed.

PHYSICAL DEVELOPMENT. London has evolved, as have many other large urban centres, out of a series of ancient villages which have grown into one another by common expansion. The community structure of the former villages can still be traced, overlaid by the general development. In *e.g.*, Blackheath, Dulwich, Chelsea, Lee, the old world atmosphere of the former village can still be sensed. Some of the former centres have become focal points and prominent local shopping centres; Brixton, Lewisham, Peckham are examples.

Transport Facilities

When rlys. first came to London in mid-19th cent., the termini at Euston, St. Pancras, and Victoria were on the outskirts of the town. London is now covered by a network of rlys.—surface, underground (at basement level), and "tube"; all the main lines terminate in London. Buses cover every district, and numerous taxicabs ply for hire. Trams, introduced 1861, disappeared 1952.

London's transport has developed without co-ordination and, particularly in the matter of roads, has tended to lag behind need. As London has grown, the transport problem has been intensified. Road widening and extension, improvements in underground and surface rlys. have had constantly to be undertaken; circular roads around London to divert traffic that would otherwise pass through the centre are under construction or in project. Cross-river traffic is a perennial problem. The Thames is, within the co. of London, crossed by ten road bridges under the control of the L.C.C., as well as by four bridges controlled by the City corporation. There are six rly. bridges, two pedestrian tunnels (at Greenwich and Woolwich), two vehicular

tunnels (Rotherhithe and Blackwall), and a free ferry for vehicles and pedestrians at Woolwich. Further bridges and tunnels are under construction or planned.

Architectural Styles

Its architecture has made London the butt of criticism of town-planners and a source of endearment to those to whom variety appeals. It includes a few medieval buildings, churches and public buildings often of Portland stone, a mixture of flat, brick-built houses of the 18th cent. and semi-basement brick and stone residences of the 19th, interspersed with examples of Victorian Gothic, all darkened with the grime of years, and huge dept. stores, super-cinemas, blocks of flats, and offices in reinforced concrete of the latest design. Large areas of 20th cent. red brick housing of terrace and villa types fill the outer suburbs.

The ever-moving tide of social change has had, and will doubtless continue to have, its effects. Neighbourhoods alter with the trends of fashion and habit. Districts that were once, like Belgravia and Mayfair, exclusively residential are invaded by commercial and professional business; districts that once were high-class grow depressed and workaday. The large town house goes out of fashion, and flats become the vogue.

The air-raids of 1940-1945 scarred London badly, making some localities unrecognizable. The broad outlines, however, remain. S. Paul's continues to dominate the City, the west end remains the centre of culture, fashion, and entertainment, the east end the main area of working-class life. The City is the commercial centre of office, bank, and counting house.

London lost some of her architectural glories—notably, many of Wren's churches in the City—but her citizens won the battle honours of patience and steadfastness under trial. The pop. of the co. fell from over 4 millions to just over 2 millions. With the end of hostilities London filled again, the pop. rising to 3½ millions by the end of 1945; there was acute shortage of housing and business accommodation.

Plans for Reconstruction

London, however, like her Cockney inhabitants, is irrepressible. Great plans for reconstruction were prepared by the public authorities during the Second Great War. The County of London Plan, 1943, issued by the L.C.C.,

the City of London Plan, 1944, prepared by the City, and the Greater London Plan, 1944, issued by the govt., laid down the broad lines of post-war re-development. Projects for ring roads for fast traffic, increased open space and amenity, new schools, and the decongestion of pop. and industry are among schemes to be implemented before the end of the 20th century.

London of the days of Sherlock Holmes and R. L. Stevenson has disappeared. The horse bus and the hansom cab are seen no more. The old-time "London particular" fog, yellow as pea soup, offspring of coal smoke, survives but, under the beneficent influence of smoke abatement laws and electrification, only as an occasional pale mist.

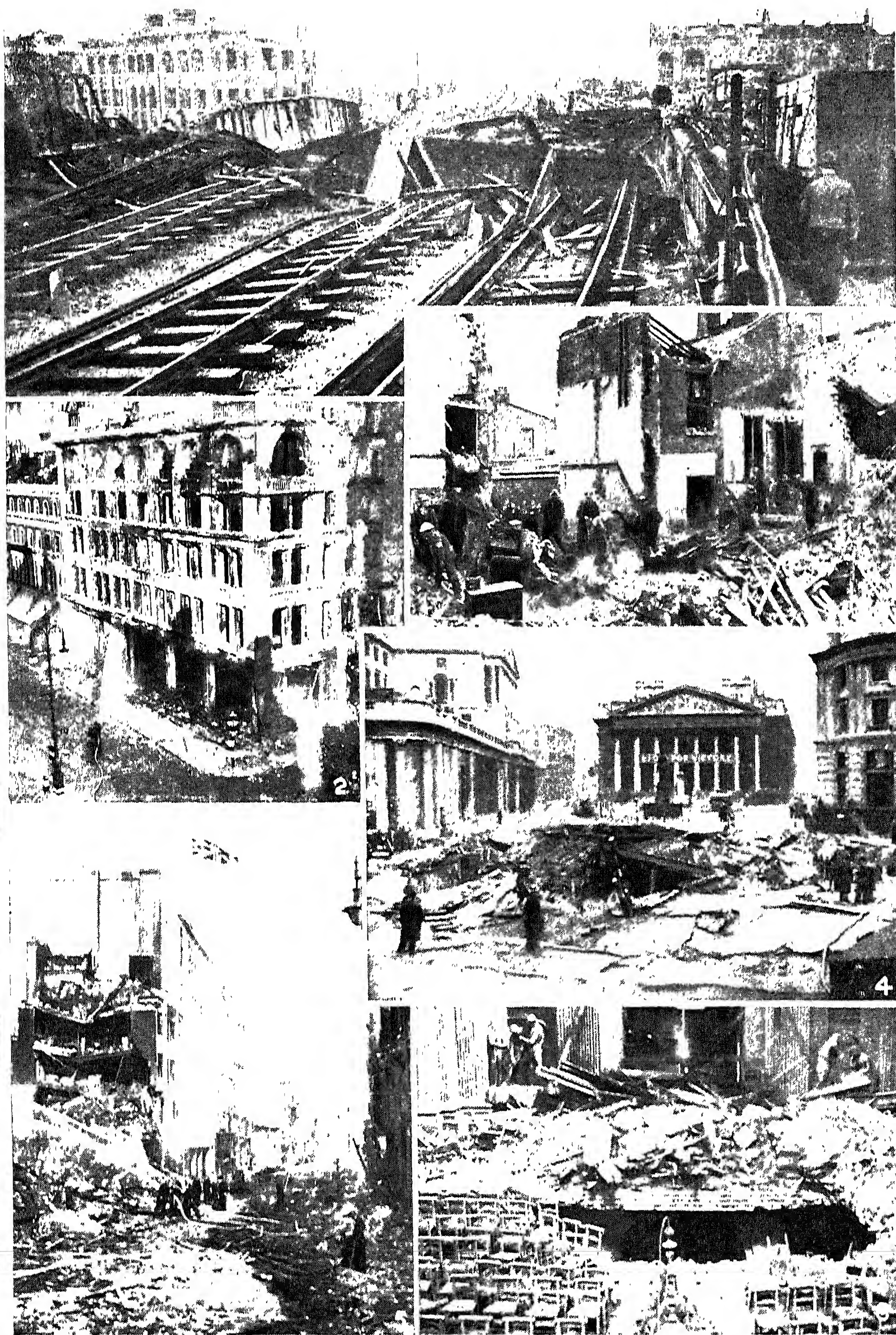
The movement towards planned reconstruction has brought consciousness of the value of the old. Buildings of architectural and historic merit are not to be ruthlessly swept away; while the opportunity presented by the enemy's clearance of many sites in the city was used to study Roman and other archaeological remains normally buried under bricks and mortar. London will retain continuity with her great past and continue to be an embodiment of the pride, the achievement, and the affection of the whole British people.

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1. Wrecked railway line, Southwark St. bridge (S.R.), just S. of Blackfriars station. 2. A large store in Oxford St., gutted after a severe attack. 3. A.R.P. repair squad in the ruins of a row of small houses. 4. Bomb

crater outside the Bank of England (left) and the Royal Exchange. 5. High Holborn looking E. after a big all-night raid. 6. N. transept of St. Paul's, damaged in one of the big raids over the City of London

LONDON SCENES DURING THE HEAVY GERMAN AIR ATTACKS OF 1940-41

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W. Eric Jackson

THE SECOND GREAT WAR. Preparations to meet aerial attack on London started at the time of the Munich crisis, Sept., 1938. Distribution of gas masks and the organization of a civil defence force began, and plans (put partially into practice at that time) were drawn up for evacuation of sections of the pop. and of govt. depts. Steel outdoor (Anderson) shelters were distributed free in Feb., 1939, to families who lived in houses and whose income was below £250.

During Sept. 1-3, 1939, 300,000 official "evacuees"—school children, expectant mothers, and aged and blind persons—were sent out of London; and parties continued to leave at intervals until Nov. 10, 1943; official evacuation was reopened July 1-Sept. 7, 1944, to counter the danger from flying bombs.

First Air Raid Warnings

The London sirens sounded their first air raid warning—a false alarm—as the prime minister finished broadcasting the announcement on Sunday, Sept. 3, that the country was at war. The blackout of all artificial lighting which was to last until Sept. 17, 1944, had begun on Sept. 1. Notices announcing AIR RAID SHELTER appeared overnight above basements, some of them reinforced; signs in every street pointed to wardens' and first aid posts, and gas cleansing and fire stations. Zig-zag shelter trenches were dug in many of the parks and squares, to be later roofed in with steel. Statues and monuments in the streets were either removed to a place of safety or bricked up. Barrage balloons went up, and around London A.A. guns were sited, the outermost about 13 m. away.

Sirens sounded again on the night of June 24-25, 1940; and "spotters," whose task after the air raid warning had been sounded was to notify approaching enemy aeroplanes, were thereafter placed on the top of many buildings. The first air attack in the London area came on Aug. 16, when 30-40 bombs were dropped in a S.W. suburb; the first all-night raid on central London was on Aug. 24. The battle of London began on Sat., Sept. 7, with a day and night attack on the docks by more than 600 raiders coming in in waves. Raids continued nightly until Nov. 3, when there was no alert; few nights to the end of Dec. passed without an attack. The opening months of 1941 brought

occasional raids, but after May 10-11 there were no further severe attacks until early 1944.

Blast walls of brickwork were put up outside the doorways of office buildings; many ground floor window openings were sand-bagged, many upper windows were bricked up, and when window glass was blown out it was replaced by wood or cardboard. Surface shelters of brick and reinforced concrete were built in every road and open space. It had been intended to keep the tube rly. stations (used as air raid shelters during the First Great War) clear during alerts; but when severe night raids started people carrying blankets and their treasures in suitcases bought 1½d. tickets and took possession, sleeping on platforms and stairways until in Nov. 79 stations were fitted with 7,600 three-tier bunks for which season tickets were issued. When the shelter facilities in these stations were ended May 6, 1945, London Transport added up the nightly numbers of those who had slept in these bunks and made the total forty millions. At the time of the worst raids, however, at least two-thirds of Londoners remained in their homes; the city's sprawl was an aid to safety. The windows of omnibuses, trams, and trains of London Transport, which ran throughout the raids, were covered with protective netting to reduce the danger of their splintering. Indoor steel table (Morrison) shelters were issued in Feb., 1941.

Narrow Escape of S. Paul's Cathedral

A one-ton delayed action bomb that penetrated the roadway in front of S. Paul's cathedral on Sept. 11, 1940, was dug out and carted away to be exploded in Hackney marshes, where in the course of time many others joined it, together with hundreds of tons of rubble from shattered buildings. In Oct. a bomb penetrated the roof of S. Paul's, and it was hit again the following April; but though the cathedral was damaged the devotion of the special band of watchers who volunteered to care for it saved it from destruction; its survival was an important contribution to Londoners' morale. Buckingham Palace was hit on Sept. 10, 1940; but the king and queen remained in London throughout the war.

A fire-raising raid on the night of Dec. 29-30 started some 1,500 fires and destroyed acres of buildings in the narrow streets and alleys of the oldest part of the

City; many water mains were damaged, the Thames was at low-tide, and the firefighters could not get water. Only towards the end of 1941 was completed the system of large surface pipes laid along the chief roads and fed by pumps from the river which, with many new water tanks built on cleared sites, would have provided adequate water in the event of another fire attack. Between Sept. 1, 1940, and July 31, 1941, fifty thousand H.E. and countless incendiary bombs fell on London.

Effects of Air Raids

Information kiosks set up by London Transport directed people whose normal bus or tram route or rly. station was out of action through the presence of unexploded bombs or road blocks due to bomb cavities or heaps of rubble. Broken gas and water mains, telephone and electric cables were repaired during raids and with remarkable expedition. A temporary bridge was thrown across a crater in Charing Cross road; a crater in Lancaster place caused the closing of (the pre-war temporary) Waterloo bridge, but work continued on the new bridge, which was opened to traffic Aug. 11, 1942. The approaches to a number of Thames road bridges were hit, and there were many near misses close to the innumerable rly. bridges in S. London, but only Hungerford footbridge was cut, by a flying bomb; a wood-and-steel emergency bridge between Westminster and Charing Cross was used by pedestrians until Hungerford bridge was repaired; a second emergency bridge, between Lambeth and Vauxhall, and a third, between Chelsea and Albert bridges, were never used. All the main line rly. termini were damaged by blast; Paddington, Liverpool Street, Victoria, and S. Pancras received direct hits. Bombs fell all round Clapham Junction, largest rly. junction in the world, but rarely put it out of action. The enemy's onslaught on the dock area, however, reduced the activity of the port, dockers, barges, and grain elevators from which were transferred to a temporary port at Gareloch in the Clyde.

When in June, 1940, France was defeated and invasion of England seemed imminent, all public buildings were barricaded with barbed wire and with defensive netting. Camouflaged concrete blockhouses were built at strategic points—one of the most conspicuous in Parliament square so well disguised as a

bookstall that hundreds of people passed it every day without realizing that it was a fake. An anti-tank ditch was constructed all round London some 12 m. from the centre.

The removal of iron railings from parks, private gardens, and squares during 1942, which gave public access to squares (*e.g.* St. James's, Russell, Berkeley) never open before except to occupiers of the surrounding houses, produced about 135,000 tons of scrap iron.

Many business firms, banks, and societies evacuated part or the whole of their organization to the country. Some govt. depts. and parts of others moved out; but the govt. itself and depts. dealing with the conduct of the war remained in the capital. The commons met in their own house until it was destroyed by fire during an air raid on May 10-11, 1941; thereafter they met first at Church House and later in the chamber of the upper house, the lords then meeting in Church House. Seventy feet below Whitehall was the cabinet h.q., construction of which began shortly after Munich; Winston Churchill's wartime broadcasts were made from his private room there. The Admiralty built a bomb-proof citadel behind its pre-war building.

After the German occupation of Europe in 1940, London became throughout the war the seat of the exiled govts. of Poland, Norway, Belgium, the Netherlands, and Czecho-Slovakia, and h.q. of the Free (later Fighting) French until 1943; the exiled govts. of Yugoslavia and Greece were in London, 1941-43. From 1942 the U.S. army and military police uniforms were a familiar sight.

Headquarters for European Invasion

In Aug., 1943, preparations for the invasion of Europe began under Lt.-Gen. F. E. Morgan at Norfolk House, St. James's Square, which became Gen. Eisenhower's h.q., Jan.-March, 1944, when he moved to Bushey park, Middlesex, on the outskirts of London.

The "little blitz" on London followed Eisenhower's arrival. Enemy bombers, on most of the 20 attacks during Jan.-March, 1944, about 100 in number, were met by a barrage of intense violence. On the night of Feb. 23-24 they damaged the London library and Chatham house in St. James's Square.

Caissons for the Mulberry harbours were made in the Thames estuary, and London was a mounting port for landing craft taking part in the invasion of France on

June 6, for some days before and after which military convoys travelled almost continuously through London on their way to their assembly points. On June 13 the flying-bomb (*g.v.*) attack began; during June 13 Sept. 4 more than 2,300 flying-bombs fell on London; one on June 18 destroyed the Guards chapel at Wellington barracks; another on June 30 fell just outside the Air ministry's office in Aldwych. No London borough escaped damage; Wandsworth was the most severely hit. The bombardment went on through the 24 hours; but Londoners continued by day to go about their life and work, pausing to take shelter only when they heard the sound of an approaching missile. At night, some of them used the eight deep shelters which, started in 1941, were opened during July, 1944. A hundred ft. below ground, these were bomb-proof, gas-proof, and water proof; each could sleep 8,500, and in emergency shelter 35,000. The first rocket bomb (*see* Rocket) to reach London fell at Chiswick on Sept. 8; more than 500 fell in London. One, on a Sat. morning in Nov., killed 160 in New Cross.

The worst "incident" of the war connected with air attack on the U.K. occurred at Bethnal Green, March 3, 1943, when 173 were killed as crowds entering a shelter lost their self-control through the firing of A.A. rockets.

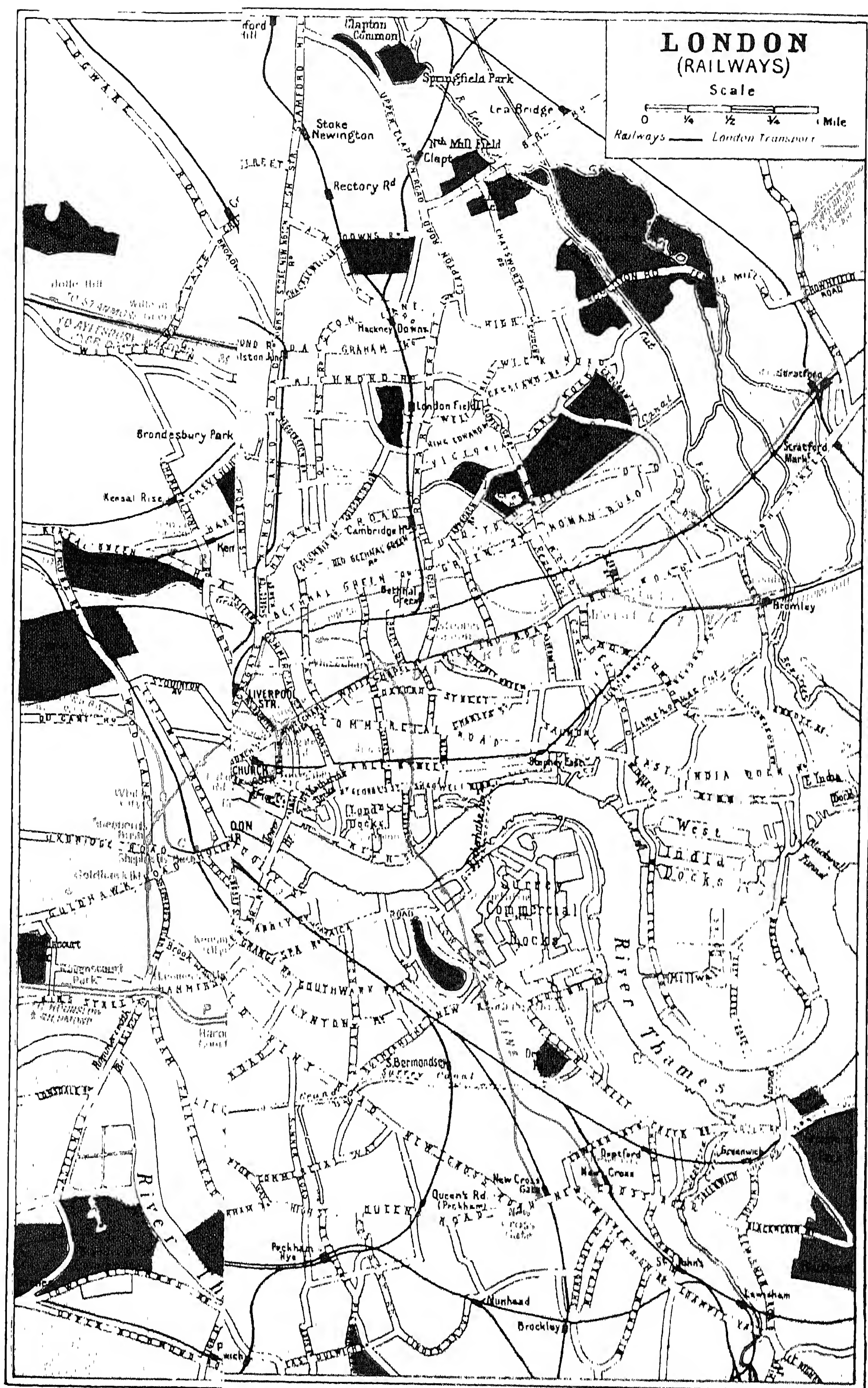
Total War Casualties

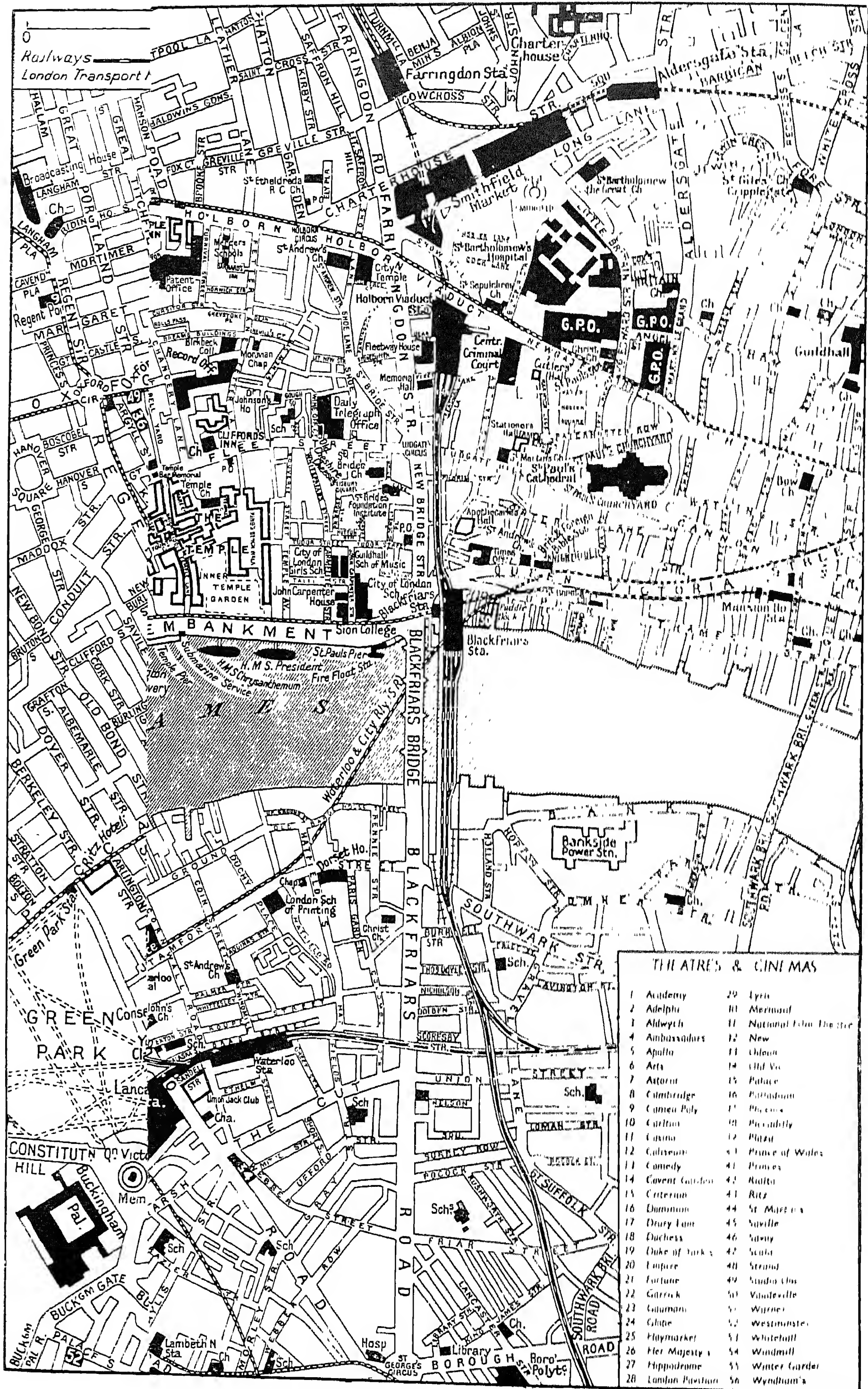
A total of 29,890 citizens of London were killed by enemy action, 50,497 injured and detained in hospital; 1,400,245 houses were destroyed or damaged by bombs—many slightly, but enough were uninhabitable to make the housing shortage serious when evacuated Londoners were, on May 2, 1945, officially invited, if their homes were habitable, to return. The first temporary prefabricated houses which helped to remedy this shortage were erected in Poplar, 1943.

The lantern in the clock tower at Westminster was relit April 24, 1945; and from 10, Downing Street, Churchill broadcast the announcement of the end of the war in Europe on May 8, Clement Attlee that of the war with Japan at midnight, Aug. 14-15.

Consult Bombers' Moon, Nopley Pearson, 1941; Front Line, H.M.S.O., 1942; Cockney Campaign, F. R. Lewey, 1944; The Siege of London, R. Henry, 1946; The Lost Treasures of London, W. Kent, 1947.

Irene Clephane





SHOWING CHURCHES, PUBLIC BUILDINGS ETC.

London. City and port of entry of Ontario, Canada. In Middlesex co., it stands on the Thames, 105 m. S.W. of Toronto. It is served by the C.N.R., C.P.R., also by the Père Marquette and Michigan Central lines. It has electric tramways which also run to Port Stanley on Lake Erie. The seat of the university of W. Ontario and of R.C. and Anglican bishops, it has for chief buildings the two cathedrals and other churches, hospitals, etc. Industries include the manufacture of agricultural implements and machinery, chemicals, furniture, leather, etc., and here are petroleum refineries and shops of the C.N.R. Electric power is obtained from Niagara falls. London was founded 1825. Pop. (1951) 95,343.

London, CRIES OF. Calls of street vendors and others. All but obsolete today, they ranged from the cries of watchmen and watermen, bellmen and boatmen, shopkeepers and apprentices, to those of the hundreds of itinerant traders, balladmongers, etc., who plied their wares or callings in the city streets. Of the trade cries the earliest mention is in Lydgate's 15th century ballad, *London Lyekpenny* (lack-penny), which throws an interesting light on the life of his time. Many of the cries, like Sweet Lavender, were harmonised, and were illustrated by drawings of the criers by T. and J. Bewick, Rowlandson, Cruikshank, Crowhall, and Hogarth (*The Enraged Musician*); they are referred to by the old dramatists (Jonson's *Silent Woman* and *Bartholomew Fair*); by Addison in *The Spectator* (No. 251); and in the *Roxburghe ballads*.

Illustrative drawings by Marcellus Laroon or Lauron (1653-1702) were popularised by the engravings by Pierce Tempest (1653-1717), and, like the series by Francis Wheatley, R.A. (1747-1801), engraved by Schiavonetti (1765-1810) and others, are valued by collectors. The cries of Bologna

have been described by Annibale Caracci (1560-1609), and those of Paris by Victor Fournel in *Les Cries de Paris, Types et Physiologies d'Autrefois*, 1887. *Consult* *History of the Cries of London, Ancient and Modern*, C. Hindley, 1884; *Old London Street Cries*, A. W. Tuer, 1885.

London, DECLARATION OF. International agreement about naval prize law. In 1908-09 an international naval conference was held in London, on the invitation of the British government, to consider and define naval prize law. It did not legislate; it merely codified. Ten great powers, including the U.S.A. and Japan, were represented by 37 jurists, who drew up a code to be observed in every prize court in every country. This code was called the declaration of London, 1909. It consisted of 71

not been ratified by the powers. In Great Britain, the house of lords refused to pass a bill to render it the law of the land. During the war it was found impossible for the Allies to observe the declaration. The provisions relating to blockade were never formally dissented from; but the Allies established a blockade of a new kind, and based their right to do so on the right to exact reprisals for Germany's submarine campaign. The Central Powers paid no attention to international naval law. As a result, on the first test the declaration broke down. *See* Blockade; International Law.

London, PORT OF. For an account of this body *see* Port of London Authority.

London, TREATY OF. Name given to several treaties signed in the English capital, the most important of which are the following: (1) Treaty between England and France made in 1359; its provisions were not kept, and it was replaced by the treaty of Brétigny (*q.v.*). (2) Treaty signed Jan. 14, 1814, and incorporated in the general settlement made by the congress of Vienna (*q.v.*). This established the kingdom of the Netherlands, with the prince of Orange as king, but the kingdom was not a success.

(3) In 1831 a treaty was signed in London by Great Britain, Austria, France, Prussia, and Russia. It declared that Belgium, now separated from Holland, should become an independent and neutral state. (4) In 1839, a treaty, also of London, signed by the same powers, confirmed the earlier arrangement, declared Belgium neutral, and forbade that country to make war save in self-defence. This was the agreement violated by Germany in 1914. (*See* Belgium: History).

Meanwhile by a treaty signed in London in July, 1827, the European powers decided to intervene in Greece, and drive the Turks, under Ibrahim Pasha, therefrom. This led to the battle of Navarino.

In 1852 a conference of London dealt with the succession to the duchies of Slesvig and Holstein. The protocol signed by the five great powers, also by Norway and Sweden, on May 8, 1852, declared that these duchies must be an integral part of Denmark, and that to them, as to the Danish crown itself, Christian of Glücksburg, afterwards Christian IX, should succeed on the death of Frederick VII. As it asserted that the German rights in Holstein must



London Cries. "Two bunches a penny, primroses, two bunches a penny." The first of F. Wheatley's series, 1793

articles, in which were embodied international law relating to naval warfare, as then understood in most countries. It dealt with blockade in time of war; contraband of war; the liability of neutrals to capture and condemnation for unneutral service; the destruction of neutral prizes; transfer of an enemy's ship to a neutral flag after a declaration of war; what ships could be termed of enemy character; convoy and resistance to search.

When the First Great War broke out in 1914, the declaration had

remain, it was pleasing to neither party. (See Slesvig-Holstein Question.) Treaties were also signed in London in 1871 and 1883, which dealt with the navigation and control of the Danube and the Black Sea.

On May 30, 1913, a treaty was signed at S. James's Palace to end the war between Turkey on the one side and Bulgaria, Serbia, Greece, and Montenegro on the other. The first meetings, at the end of 1912, had been suspended, and the war renewed. In March, however, Turkey agreed to mediation, as did her foes in April. The representatives met again, and the treaty provided that Turkey should give up Crete to Greece, and should be confined in Europe to a line drawn from Enos to Midia. The Balkan states, however, failed to agree upon a division of this ceded territory, and the second Balkan War began. The treaty was thus never operative. (See Balkan Wars.)

The term treaty of London is given to the secret agreement signed April 28, 1915, between Great Britain, France, and Russia on the one hand, and Italy on the other. Italy agreed to enter the war on the side of the Allies, and the treaty stated the conditions of such assistance. Among these were undertakings that by the treaty of peace she should receive Trentino, part of Tirol, Trieste, and other lands, including some islands belonging to Austria. Other articles dealt with Italy's interests in the Mediterranean, Africa, and elsewhere, and also provided for a loan to her.

The London naval treaty between Great Britain, the U.S.A., and France was signed March 25, 1936. It was divided into five parts, and its outstanding points were definitions of capital ships, aircraft carriers, light surface and auxiliary vessels, and small craft; placing limitations upon the maximum displacement and the size of the heavy armament in battleships, aircraft carriers, and submarines; and prohibition of the construction of capital ships or light surface vessels, other than aircraft carriers between 8,000 and 17,500 tons, before Jan. 1, 1943. The treaty also provided for an annual interchange of information about naval construction programmes. In the event of any of the contracting powers becoming engaged in war, liberty was given to suspend the provisions of the treaty, which was to remain in force until Dec. 31, 1943.

London, JACK (1876-1916). American novelist. John Griffith



Jack London

London, born at San Francisco, Jan. 12, 1876, adventured for a time as an oyster pirate, then formed a fish patrol. Next, shipping as a sailor, in 1892-93 he visited China and Japan and hunted seals in Bering Sea. He then tramped through the U.S.A. and Canada. During the Russo-Japanese war of 1904-05 he was a war correspondent. He died in California, Nov. 22, 1916. Of his many stirring books of adventure the best known are *The Call of the Wild*, 1903; *The Sea Wolf*, 1904; *White Fang*, 1907; *Burning Daylight*, 1910. His short stories were masterly; he also made contributions to socialist literature; e.g. *The Iron Heel*, 1907.

London Airport. The official name for the international commercial airport opened by the British ministry of Civil Aviation, 1946. It is in the district formerly known as Heathrow, situated in Middlesex, 14 m. W. of the centre of London, between the Bath and Great South West roads; the nearest towns are Feltham and Hounslow (Heston and Isleworth borough). In its final form, with nine runways all capable of taking the heaviest of land aircraft, the airport is planned to absorb a large area north of the Bath road, the terminal and control buildings to be sited in the centre of the landing area. See Airport.

London and North Eastern Railway. British railway group which existed from 1923 to 1947. It comprised the earlier Great Northern, Great Eastern, Great Central, North Eastern, Hull and Barnsley, North British, and Great North of Scotland rlys. The London termini were King's Cross, Marylebone, and Liverpool Street, and among the main line stations were Waverley (Edinburgh), York, Newcastle-on-Tyne, Norwich, Nottingham, and Sheffield. The company owned the locomotive works at Doncaster, Darlington, Gorton (Manchester), Stratford (London), Cowlares (Glasgow), and Inverurie (Aberdeenshire). Locomotives were coloured green and coaches brown, but the engines drawing stream-lined trains were blue. The L.N.E.R. was the first British rly. to introduce a stream-

lined train (Silver Jubilee, 1935), and to build cinema cars for showing news programmes. The company operated nearly 17,000 m. of track. On Jan. 1, 1948, it was incorporated in British Railways. See Railways.

London Basin. Geological and geographical term used for the roughly triangular area lying between the chalk ridges of the N. Downs and Chiltern Hills, and containing the valleys of the Kennet and lower Thames. The general geological structure is that of a broad trough (syncline) which is pitching gently to the E. The chalk, underlain by the impervious gault clay (see Cretaceous system) forms the outside of the basin, and passes below London from one side to the other. It is overlain by Tertiary sands and clays which form an impervious layer above the chalk. The chalk is much fissured, and receives water draining from the N. Downs and Chilterns. This water, trapped between the two impervious beds above and below, flows down under London and has been extensively tapped by artesian wells.

The general shape of the London basin is the result of folding earth movements. At the close of the Cretaceous period the chalk was up-arched over the Weald and down-folded to N. and S., so forming the London and Hampshire basins on either side. Tertiary deposits - Thanet sand, Reading beds, London clay, and Bagshot sands, all of Eocene age - were then deposited in the down-warped areas. Further earth movements during the Tertiary period then further accentuated the earlier folding.

The area is still slowly moving and tilting S.E. It has been established by geodetic levelling that, since 1800, there has been a lowering of the ground surface at Harwich of about 2 ft. The various deposits in the basin give rise to variety in scenery. To the N. and S. are rounded chalk hills with open fields and beech woods. In the Aldershot area the Bagshot sands form heath-lands with conifers, heather, and gorse; the London clay and Reading beds produce heavy soils suitable for arable land, oak, and elm. The clays are used locally for brick making. Extensive flat terraces on either side of the Thames carry roads and rlys. Their gravel beds have been exploited for building material, and where their surface is silt or clay they carry market

gardens or farms. See Cretaceous System; London Clay; Tertiary System. **Gilbert Wilson, Ph.D.**

London Bridge. Chief of the Thames bridges. Designed by John Rennie (d. 1821), whose two sons supervised the work, it extends from Adelaide Place and King William Street, E.C., to Borough High Street, Southwark, S.E. The first pile was driven March 15, 1824, and William IV opened the bridge, Aug. 1, 1831. It is built of granite, is supported by five semi-elliptical arches, the central arch having a span of 152½ ft., and is 928 ft. long and 63 ft. wide, the original width of 54 ft. having been increased by corbelling out in 1903-04. The total cost, including approaches and widening, was £2,566,268.

Its immediate predecessor, also of stone, was built on the site of a wooden bridge, believed to have been built by the Romans. Peter

stroyed in 1832, and the piles were pulled up, many thousands of Roman coins and medallions, with examples of Roman pottery and tiles, were discovered. Beneath old London bridge, in 1582, Peter Morris, a Hollander, erected water-works, which existed until 1822. London bridge rly. station is on the S. side, and on the N. side of the river are Fishmongers' Hall, west, and Adelaide House, east. Consult *Chronicles of London Bridge*, by An Antiquary, 1862.

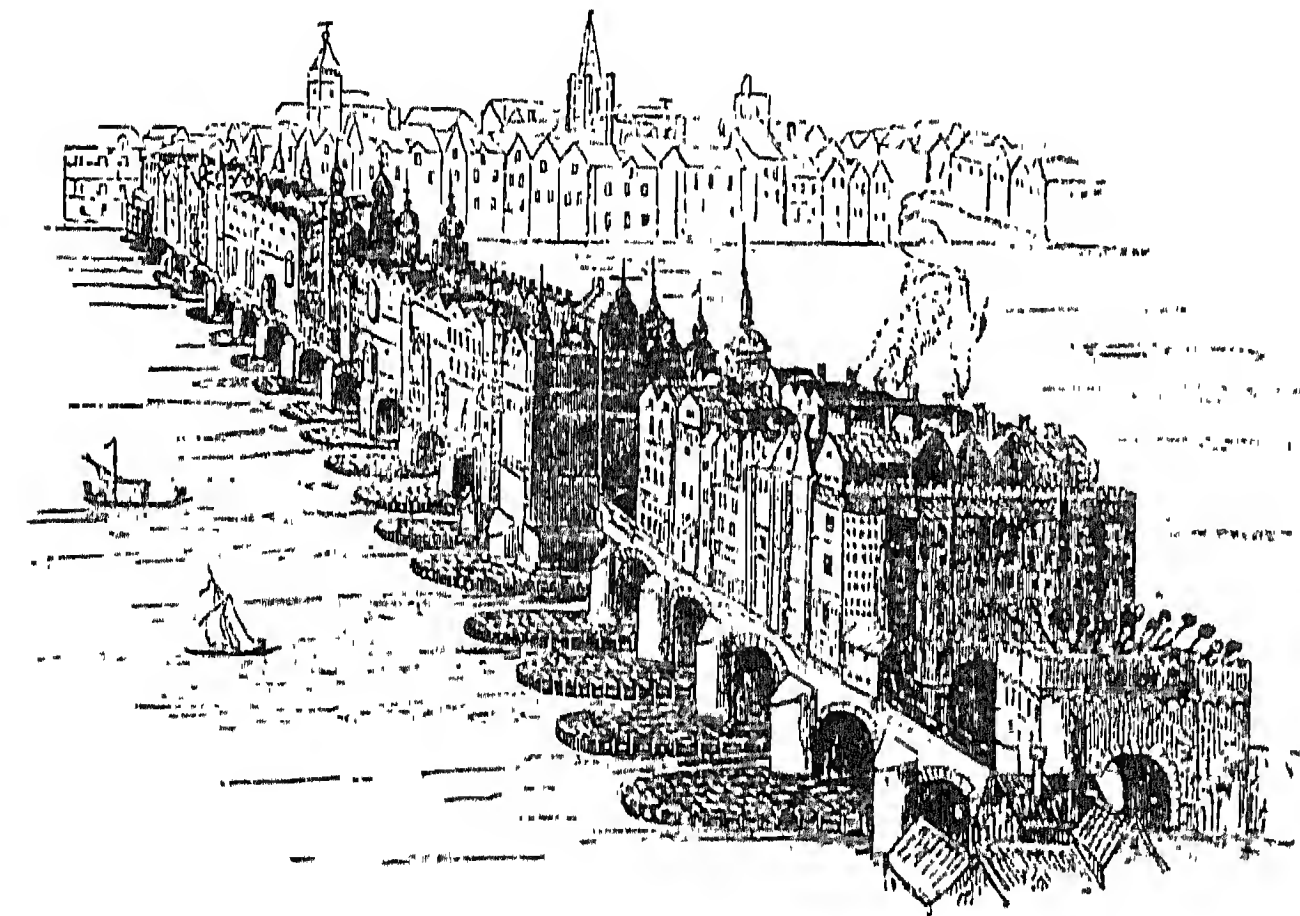
London Clay. A stiff blue clay of Lower Tertiary (Eocene) age which occurs in the London and Hampshire basins of S.E. England. It varies from about 600 ft. thickness in Essex to 50 ft. at Newbury and thins out altogether farther W. The thick clay bed acts as an impervious covering to the chalk, which is the artesian water-bearing formation underlying London.

The physical characters of the clay allow it to be easily tunnelled, which has permitted the development of tube railways. See London Basin; Tertiary System.

London County Council. Administrative body set up in 1888 to manage the affairs of the newly created county of London. It replaced the Metropolitan Board of Works, and consists of councillors elected every three years in the spring by voters in the metropolitan boroughs, and aldermen elected for six years by the councillors. At first there were 118 councillors, 19 aldermen, both later increased in number from time to time.

The council as a whole meets every fortnight, but it does most of its work through committees. It has a chairman, a vice-chairman, and a deputy chairman, and a large staff of paid officials. Lord Rosebery was its first chairman. The offices were in Spring Gardens; Victoria Embankment, and elsewhere, until the London County Hall was erected on the right bank of the river just N. of Westminster Bridge, and formally opened by George V in July, 1922.

The metropolitan boroughs form multiple-member council constituencies. Elections are usually fought on political party lines, as in national elections. During 1889-1907, with the exception of the years 1895-98, the Progressives (Liberals) had a large majority and controlled the council; during 1907-34 the Municipal Reformers (Conservatives) were in power. Then came a Labour (Socialist) majority, maintained for more than twenty years (there were no elections during the Second Great War).



of Colechurch began it in 1176. Completed in 1209 by a Frenchman named Isambert, this bridge stood E. of the existing structure, in a line with Fish Street Hill. It had 19 arches built upon piles of elm, surrounded by wooden sterlings. On fortified gates at each end heads of traitors were exposed on spikes. Wooden houses on each side were removed in 1758. Between the 13th and 14th piers from the city side was a drawbridge. In the centre was a chapel, dedicated to S. Thomas of Canterbury. Peter of Colechurch was buried in this chapel. N. of the drawbridge stood the famous Non-such House (q.v.).

Old London bridge, as it is called, was the only bridge over the Thames until 1739-50, when the first Westminster bridge was constructed; and when it was de-



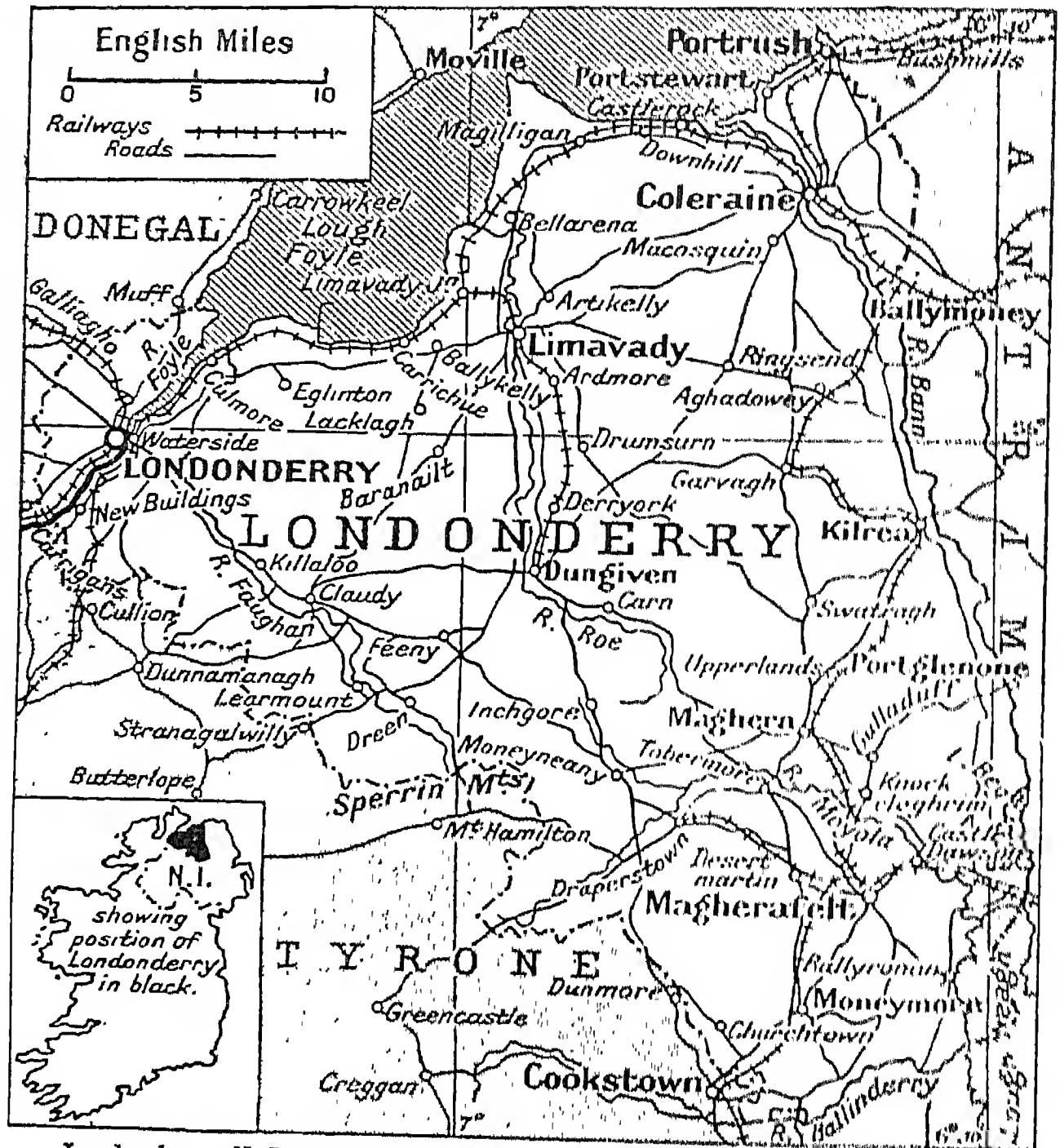
London Bridge from the south-east. On its right is Adelaide House, above which can be seen the tops of the Monument and S. Magnus: on left is Fishmongers' Hall. Top, left, from an old engraving, the bridge as it appeared about 1816. Five arches across was the drawbridge. On the gate are seen the heads of men condemned as traitors

The council is responsible throughout the whole administrative co. (including the city of London) for education (primary, secondary, and adult); town-planning and the regulation of buildings; maternity and child welfare and ambulance services; the Londoners' meals service (civic restaurants); main drainage and Thames embankment walls; licensing places of entertainment; the provision of homes for the aged and infirm, and the welfare services for handicapped persons.

Outside the city it looks after Thames bridges, and inspects shops, weights, and measures. The council in common with the City corporation and the metropolitan borough councils has power to provide open spaces and housing, but its powers are much wider in that they relate to the whole administrative co. It may, moreover, provide open spaces and housing outside the co.

Annual expenditure of the council is of the order of £55 millions, of which half is spent on education. Next come health and fire services. The net debt outstanding in 1951 was over £133½ millions. Consult *The Youngest County*, pub. by the L.C.C. in 1951.

Londonderry. County of N. Ireland. With a coast-line on the N., it has an area of 804 sq. m. The chief rivers are the Roe, Bann, Foyle, Moyola, and Faughan. The surface is level near the coast, rising to considerable heights in the S., where are the Sperrin Mts. (1,200 ft.). Lough Neagh is on its S.E. border and Lough Foyle on the N.W. Londonderry, or Derry, is the chief town; other places are Coleraine, Limavady, Dungiven, Moneymore, and Magherafelt. On the coast are the watering-places of Portstewart, Castlerock, and Downhill. The county took the



Londonderry, N. Ireland. Map of the county on the north coast of Ulster

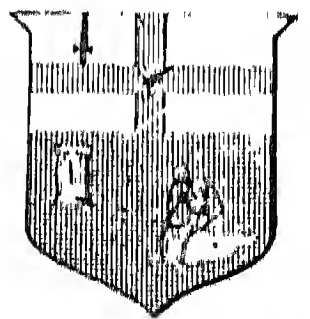
prefix of London when in 1609 much of the land, taken from the O'Neills, was made over to the corporation of the City. Later much land vested in the Irish Society of London and London livery companies was sold. Londonderry, including the city, forms a co. constituency of the U.K.; it also sends four members to the N. Ireland parliament. There is a castle at Dungiven, which also had an abbey. Pop. (1951) 155,520.

Londonderry. City, county borough, and seaport of co. Londonderry, N. Ireland, also the county town. Known locally as Derry, it stands on a hill near where the Foyle falls into Lough Foyle, 95 m. N.W. of Belfast, being on the west, or Donegal, side of the river. It is well served by rlys. The city is still surrounded by walls with gates.

The chief buildings are the cathedrals. S. Columba's, Protestant,

dates from the 17th century, but was restored and enlarged in the 19th. The R.C. cathedral of S. Eugenius is modern. There is a guildhall. Foyle College dates from 1617, and there are other colleges and schools. A monument commemorates the siege (v.l.) of 1689. The chief industries are flour-milling, distilling, shipbuilding, tanning, and bacon curing; another important one is making linen clothes. The port has quays on both banks of the river, and good accommodation for vessels. Trade is mainly in agricultural produce, and there is steamer communication with Glasgow, Liverpool, and Belfast. One member is elected to the parliament of N. Ireland.

At Derry, a corruption of the Irish Doire, meaning the place of oaks, S. Columba founded a monastery in the 6th century. It became the seat of a bishop, who in the 12th century built a magnificent church, pulled down in 1600. The bishopric is known as that of Derry and Raphoe. The industrial prosperity of the town did not begin until it had become the prop-



Londonderry arms



Londonderry, Northern Ireland. View of the city, and the surrounding hills, from across the winding river Foyle

erty of the Irish Society of London. In 1689 it was besieged by the troops of James II as a Protestant stronghold. Its present inhabitants are almost equally divided between Protestants and Roman Catholics, and affrays between them have been frequent. There was serious rioting in 1920. The U.S. government constructed here during the Second Great War one of the best equipped naval bases in Europe; it cost several million pounds and was completed in six months, being put into commission on Feb. 5, 1942. From Londonderry U.S. destroyers and corvettes escorted convoys across the Atlantic in cooperation with the Royal Navy. Pop. (1951) 50,099.

Londonderry, SIEGE OF. Enterprize of James II and the Irish Jacobites in 1689. From the town, the chief stronghold of N. Irish Protestantism, James's garrison had been withdrawn, and 13 apprentices defied him by closing the gates, Dec. 7, 1688. James advanced in April with a large force, and Robert Lundy, the military governor, fled after advising capitulation, but a cry of no surrender became the watchword of the city. A clergyman, George Walker, was chosen governor, and siege operations began on April 19. William III's government had on March 30 planned relief, but mismanagement caused much delay; meanwhile famine and disease reduced Derry to the utmost straits. In mid-June a fleet entered Lough Foyle with provisions and four regiments under Maj.-Gen. Kirke, but they waited six weeks outside the harbour. Ordered at last to attack, the ships broke the boom, July 30, and raised the siege, which had lasted 15 weeks.

Londonderry, MARQUESS OF. British title borne by the family of Vane-Tempest-Stewart. There was an earl of Londonderry from 1623, the title being given to Thomas Ridgeway, a Devon man, who had secured land in Ulster. The title became extinct when his descendant Robert, the 4th earl, died in 1714. In 1726 the earl's son-in-law, Thomas Pitt, was made earl of Londonderry, but the title again lapsed in 1765.

In 1789 Robert Stewart, M.P. (1739-1821), of Mount Stewart, co. Down, was made Baron Londonderry, being raised in 1796 to earl and in 1816 to marquess. His son was prominent under the courtesy title of Viscount Castlereagh (*q.v.*). The latter's half-brother, Charles William, the 3rd marquess (1778-1854), was a soldier and a diplo-

matist. He married the heiress of the families of Vane and Tempest, and obtained rich estates, including collieries, in Durham. He was made a peer of the U.K. as Baron Stewart in 1814 and in 1823 Earl Vane, a title that passed to his son by a second marriage.

In 1884 the title came to Charles, 6th marquess (1852-1915). Born July 16, 1852, and educated at Eton and Christ Church, Oxford, he was Conservative M.P. for Down from 1878 until he inherited the title. He was lord-lieutenant of Ireland, 1886-89; postmaster-general, 1900-02; and president of the board of education, 1902-05, also lord president of the council from 1903. He died Feb. 8, 1915.

His son Charles Stewart Henry (1878-1949) became 7th marquess. Born May 13, 1878, he went to Eton and Sandhurst, and was Conservative M.P. for Maidstone, 1906-15. Under-secretary for air, 1920-21, he took office in the first government of N. Ireland as minister of education and leader of the senate. Returning to Westminster, he became first commissioner of works, 1928-29, and again in 1931; secretary for air, 1931-35; lord privy seal and leader of the house of lords, 1935. He wrote *Ourselves and Germany*, 1938; *Wings of Destiny*, 1943. He was also known for his receptions at Londonderry House, Park Lane, on the occasions of the opening of parliament. Dying Feb. 11, 1949, he was succeeded by his son Edward (b. 1902), 8th marquess. The family seats of the marquess are Wynyard Park, Durham, and Mount Stewart, Down. An eldest son is known as Viscount Castlereagh.

Londonderry Air, TUNE. Irish folk tune first published 1855, in a collection made by George Petrie (*q.v.*), Irish antiquary. Its beautiful phrasing and haunting melody gave it immediate popularity, and many lyrics have been written to the tune, notably by A. P. Graves and F. E. Weatherly. It has also been adopted as a hymn-tune, and Stanford introduced it into his 1st Irish Rhapsody.

London Gazette, TUE. Official organ of the British government and the appointed medium for state proclamations, orders in council, and diplomatic, colonial, services, civil, and ecclesiastical appointments. It is also the medium for advertisements required by statute. Published Tuesdays and Fridays, the ordinary issues may be augmented by supplements. This is a continuation of

the Oxford Gazette which appeared Nov. 14, 1665, during the Great Plague, the present title beginning with No. 24 of Feb. 5, 1666, on the return of Charles II to London. Sir Richard Steele was an editor. Down to 1696 an edition in French was issued. Published for many years at 1s., the gazette has cost 2s. since 1920. Similar publications for Scotland and N. Ireland appear as *The Edinburgh Gazette* and *The Belfast Gazette*.

London Group. Body of British artists. Owing its origin to the amalgamation of several small groups of painters including the Camden Town group and the Allied Artists' Association, just before the First Great War, it held its first exhibition at the Goupil Gallery, London, in March, 1914. Van Gogh and Gauguin were exerting a predominating influence on English painters, though Sickert had asserted an impressionism derived from Manet and Degas in his Camden Town interiors and music-hall scenes. The London Group became the focus of progressive work, regular exhibitors including Sickert, Spencer Gore, Charles Ginner, Paul and John Nash, C. R. W. Nevinson, and Mark Gertler. Wyndham Lewis and Jacob Epstein joined the group, which continued to hold annual exhibitions at various London galleries. At a retrospective exhibition at the Leicester Galleries, 1928, a remarkable collection of paintings and sculpture was shown. In 1943 the group organized its fifth wartime exhibition at Burlington House, when younger artists whose work attracted attention were John Tunnard, Eileen Agar, and Victor Pasmore. See New English Art Club.

London Hippodrome. Playhouse at the corner of Cranbourn St. and Charing Cross Road, London, W.C. It was opened Jan. 15, 1900, as a variety theatre, and was long a centre of circus and aquatic entertainment. Remodelled and enlarged, it became well known for revues and musical comedies, *e.g.* *Hello, Ragtime!* 1912; *Brighter London*, 1923; *Hit the Deck*, 1927; a series starring Bobby Howes; another with Vic Oliver; *The Lisbon Story*, 1943; *Perchance to Dream*, 1945. The theatre seats 1,340.

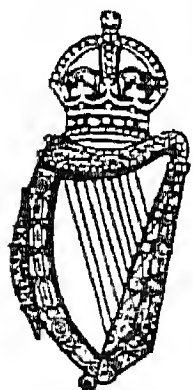
London Hospital, TUE. Teaching hospital of the University of London, in Whitechapel Road, E.1, which was founded as a charity in 1740. Ministering to the vast industrial population of the E. half of the capital, it is the largest general hospital in the U.K. It



London Hospital. Main buildings in Whitechapel Road

maintains 686 beds with 381 beds at annexes. Accident and urgent cases are admitted at all times. There are aural, cardiac, dental, dermatological, gynaecological, neurological, neurosurgical, ophthalmic, orthopaedic, paediatric, psychiatric, thoracic surgery, physical medicine, radiotherapy, plastic surgery, and venereal diseases dept.; and training schools for nursing and midwifery, physiotherapy and radiography. In 1956, 17,101 in-patients were treated; out-patients made 760,380 attendances. The London Hospital medical college, founded 1785, was incorporated as a school of London University in 1900.

London Irish Rifles. Territorial regiment of the British army. Formed in 1859 as a volunteer unit, the regiment first saw active service in the S. African War of 1899-1902. When the volunteers were organized into the Territorial Force in 1907, the London Irish Rifles became the 18th battalion of the London Regiment; it served in France and Flanders, earning distinction in 1915 at Festubert and at Loos, where its men went in to the attack kicking a football. Two battalions served in the Second Great War with the 56th div. in Africa, Sicily, and Italy. When the Territorial Army was reformed in 1947, the London Irish became a motorised infantry regiment of the 56th (London) armoured div.



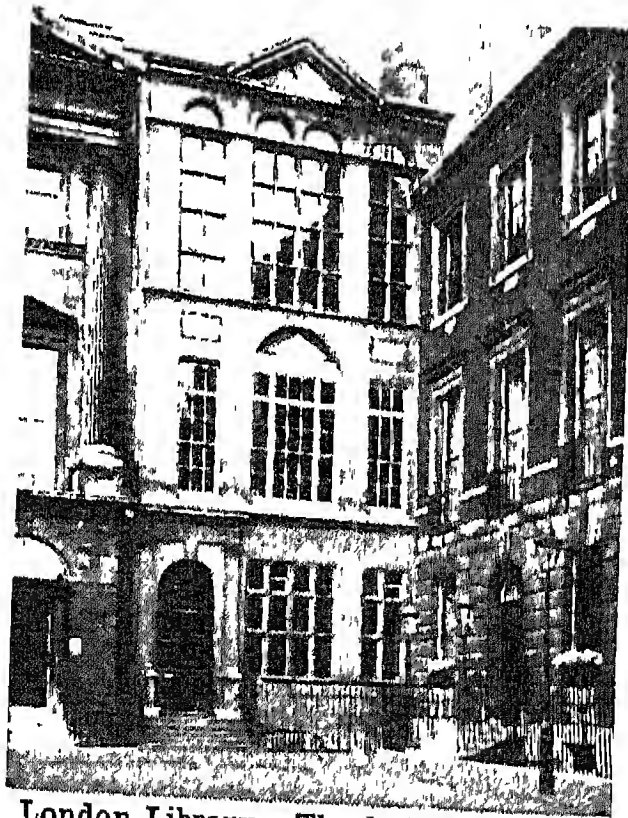
London Irish Rifles badge

London Library. British subscription library. It was opened at 49, Pall Mall, on May 3, 1841, with a collection of about 3,000 volumes, and originated in an agitation, started by Carlyle and strongly supported by other eminent men, for an institution which would make good books in all departments of knowledge available to members in their own homes. On May 15, 1843, a reading room was opened for

members; and in 1845 the library was removed to Beauchamp House (later 14), St. James's Square; the freehold, with that of adjacent premises in Duke Street, was purchased in 1879. The premises were rebuilt in 1897 and extended in 1920 and 1934. Some of the later work, destroyed by a German bomb from the air in 1944, was subsequently restored; book losses included volumes of biography and on religion, and old, irreplaceable periodicals.

By 1957 the number of books available had increased to over 600,000. The library, which enjoys distinguished patronage, is governed by a committee consisting of a president, vice-presidents, and some 20-24 other members. It rendered considerable assistance to government departments in quest of information during both Great Wars. The committee has included among its members Carlyle, Tennyson, Elgar, Inge, E. M. Forster, Harold Nicolson, and A. N. Whitehead.

London, Midland, and Scottish Railway. British railway group which existed during 1923-47. It comprised the former London and North Western, Midland, Lancashire and Yorkshire, Caledonian, North Stafford, Furness, and several smaller rlys. The London termini were Euston, Fenchurch St., and St. Pancras, and the company's principal locomotive works were at Crewe and Derby. Locomotives and passenger coaches were painted maroon.



London Library. The building at the north-west corner of St. James's Square

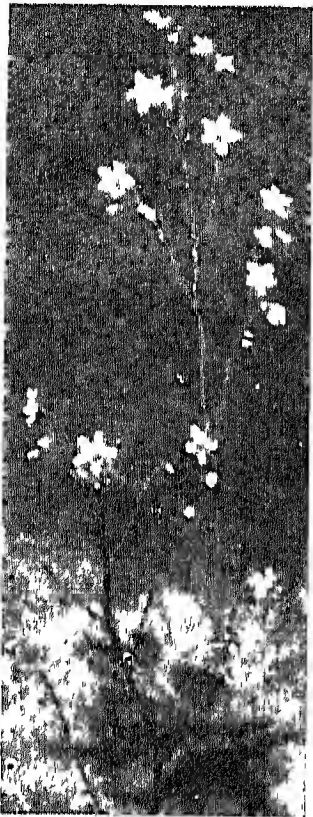
With 20,000 track miles, this was Great Britain's largest railway system before nationalisation and served such widely separated towns as Bournemouth, Southend-on-Sea, Gloucester, Liverpool, Holyhead, Manchester, Carlisle, Stranraer, Edinburgh, Dundee, and Thurso. Between Dalwhinnie, Inverness-shire, and Dalnaspical, Perthshire, the line runs 1,481 ft. above sea level, the highest point on any main line in Great Britain. On Jan. 1, 1948, the L.M.S. was absorbed in British Railways.

London Museum. Institution formed on the lines of the museum in the Hotel Carnavalet, Paris, to serve as an object lesson in the history of the English metropolis. It was founded in 1911 to commemorate the coronation of George V. Sir Guy Laking was the first director, 1911-19. When the London County Council refused to provide a home for the museum in the new county hall, King George, in addition to being a contributor, made over a set of apartments at Kensington Palace as a temporary home for the nucleus of the collection, and formally opened it in person, March 21, 1912.

Lancaster House, presented to the nation in 1912 by Sir William Lever (later Lord Leverhulme), was taken over by the government in 1913, and the exhibits having been removed here, the museum was reopened in 1914, but was closed during the First Great War. One of the early collections acquired by the trustees was the Hilton Price collection of London antiquities, and this, having been supplemented by other purchases, gifts, and bequests, illustrates London and London life from prehistory. The museum was closed during 1939-42, when it was partly reopened. It was closed again in 1944 owing to flying bomb attacks. In 1951 it was reopened in a wing of Kensington Palace, lent by George VI for 15 years.

London Opera House. Theatre in Kingsway, London. It was designed by Bertie Crewe and erected by Oscar Hammerstein (1817-1919) for the production of grand opera. He opened it on Nov. 13, 1911, with Jean Nougue's opera, *Quo Vadis?*, but his efforts were not crowned with success and the building was closed in 1913, to be reopened in 1914 as a theatre of varieties. It was later taken over by Sir Oswald Stoll and remained The Stoll Picture Theatre, providing cinema entertainments. For its subsequent history, see Stoll Theatre.

London Passenger Transport Board. Organization formed in 1933 to coordinate the passenger services of London. On Jan. 1, 1918, it became part of the nationalised transport system under the title London Transport Executive. See London Transport.



London Pride.
Spray of flowers

London Pride (*Saxifraga umbrosa*). Perennial evergreen herb of the family Saxifragaceae. It is a native of N. Spain, Portugal, Corsica, and Ireland. The leathery, broad, oval leaves grow in a rosette, from which the branched, leafless flowering stem arises. The flowers have red-dish sepals and white petals dotted with red. It is also called

None-so-pretty and S. Patrick's cabbage.

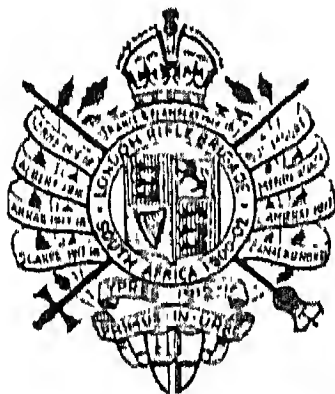
London Regiment. Former Territorial regiment of the British army. It dated from 1908, when all London Territorial battalions were united into one regiment of 26 battalions. To maintain the old connexion of the Royal Fusiliers with London, the first four battalions were affiliated to that regiment, and retained the name fusilier in their title, e.g. 1st London (Royal Fusiliers), or officially 1st (City of London) battalion the London Regiment (Royal Fusiliers). The remaining battalions were designated County of London, e.g. 9th (County of London), or Queen Victoria's Rifles.

The 1st London was raised in 1859, being then known as the 19th Middlesex; the 2nd battalion, also raised in that year as the 46th Middlesex, became the 23rd Middlesex in 1880, and soon afterwards the 2nd (volunteer) bn., Royal Fusiliers. The 3rd bn. was raised in 1859, and the 4th originated from the Tower Hamlets regiment of the London train bands. The 5th bn., or London Rifle Brigade (*q.v.*), dated from 1859, also the 6th Rifles (formerly Surrey). The 7th and 8th, known as the Post Office Rifles, both served in Egypt, 1882, and in S. Africa; the 9th was the Queen Victoria's Rifles; the 10th the Hackney; the 11th the Finsbury Rifles; the 12th The Rangers; the 13th the Princess

Louise's Kensingtons; the 14th the London Scottish (*q.v.*); the 15th the Civil Service Rifles; the 16th the Queen's Westminster Rifles. The 17th, formerly the 2nd Tower Hamlets Volunteer rifle corps, became the Poplar and Stepney Rifles. The 18th were the London Irish Rifles, raised in 1859; the 19th originated in the St. Pancras volunteers; the 20th (Blackheath and Woolwich) originated in the Royal Greenwich Fencibles. The 21st bn. became the 1st Surrey Rifles; the 22nd, The Queen's. The 23rd fought in the S. African War, as did the 24th, the Queen's. The 25th battalion the Cyclists, the 28th the Artists Rifles (*q.v.*).

The regiment had a brilliant record in the First Great War. On the W. front the 47th, 56th, and 58th divisions, mainly composed of London battalions, won lasting renown. Other battalions fought in Gallipoli and Palestine. Memorials in front of the Royal Exchange and in High Holborn commemorate the men who fell. In 1935 the regiment was disbanded as a separate formation, the units being attached to various regiments, though some retain their former badges.

London Rifle Brigade. Territorial unit of the British army. Raised in 1859 as The Prince Consort's Own Volunteers (London Rifle Brigade), it served in the S. African War of 1899-1902, and on the formation of the Territorial Force in 1907 became the 5th City of



London Rifle
Brigade badge

London Regiment. In the First Great War battalions served in France and Flanders, taking part in the engagements around Ypres, 1915; the third battle of Ypres, 1917; and the defence of Amiens, 1918. From the storming of the Hindenburg Line, it had a distinguished share in the final battles of 1918. After the outbreak of the Second Great War, the 1st and 2nd battalions of the London Rifle Brigade became the 7th and 8th of the Rifle Brigade. The former served as motorised infantry with the 8th armoured div. in Africa and the 6th armoured div. in Italy; the latter fought in a similar way with the 11th armoured div. in France, Holland, and Germany. The London Rifle Brigade was reformed in 1947 as a motorised infantry battalion of the T.A. and affiliated to the Rifle Brigade.

London School of Economics AND POLITICAL SCIENCE. Institution of higher education founded in London in 1895 through the initiative of Sidney Webb (Lord Passfield) for the study of economics, economic history, and statistics, a school of the University of London from 1900 providing courses for the B.Sc. (Economics) degree. A dept. of social science and administration was added 1912, courses for the B.Com. 1919, a faculty of laws 1921, of arts (geography and sociology) 1922, of history and of anthropology 1924, a dept. of business administration 1931. Facilities for study for higher degrees are available. The school also offers its own certificates in social science and administration, mental health, personnel management, etc., etc.; and provides evening courses for the B.Sc. (Econ.) and LL.B. degrees. The library of the school is open by arrangement to research workers and to non-members of the school. Webb was professor of public administration here 1912-27. Sir William (later Lord) Beveridge was director 1919-37. Other members of the staff have included B. Malinowski, E. Cammaerts, A. J. Toynbee, C. H., and H. J. Laski. The school is in Houghton Street, Aldwych, London, W.C.2.

London Scottish. Territorial regiment of the British army. Formed in 1859 as the London Scottish Rifle Volunteers, it is recruited in London, in normal times solely from men able to prove Scottish nationality by birth, descent, or property ownership. Its first active service was in the S. African War, when a company was attached to the Gordon Highlanders and a detachment served with the City Imperial Volunteers. When the Territorial Force was formed in 1907, the London Scottish became the 14th battalion of the London Regt. Three battalions were raised for service in the First Great War, the first battalion being the Territorial infantry that went earliest into action against the Germans, at Messines, Oct. 31, 1914. The second battalion served in France, the Balkans, and Palestine. In 1920 the regiment was reformed as a single battalion, but in 1938 a second



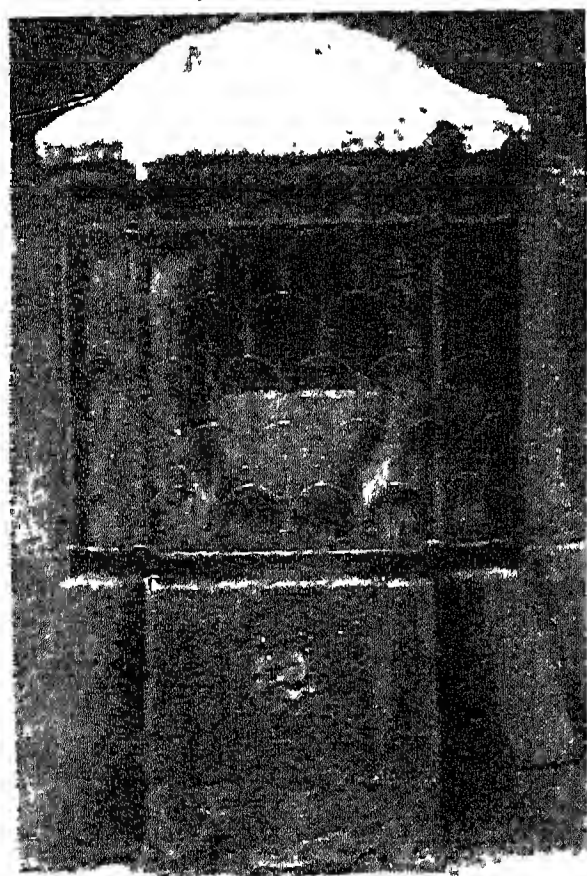
London Scottish
badge

infantry and a heavy A.A. battalion were raised.

In the Second Great War the 1st battalion served in Persia, N. Africa, Sicily, and Italy, while the 3rd (A.A.) was in Egypt and Italy. The 2nd battalion became a reserve and draft producing unit, most of the personnel passing through its ranks going to the 51st Highland div. Nearly 10,000 men joined the regt. In 1947 the London Scottish became a single-battalion regiment of the T.A., affiliated to the Gordon Highlanders. Its hoddie grey kilt is the tweed of the Elcho family, Lord Elcho, later earl of Wemyss, having been its first colonel.

London Society, THE. Organization established in London in 1912 "to unite all Londoners who see the necessity for stimulating a wider concern for the beauty of the capital city, for the preservation of its old charms, and the careful consideration of its new development." Offices, 82, Pall Mall, S.W.1.

London Stone. London relic. A solid block of oolite, such as that used by the Romans in their



London Stone, Cannon Street. The old stone, reputed to be a Roman milestone, seen behind the grille

buildings, it is set in a large stone case, protected by an iron grille, and let into the S. wall of S. Swithin's church, Cannon Street, E.C. It originally stood on the S. side of the street, opposite to its present position, which it has occupied since 1798. According to Camden, it was a miliarium or milestone from which the British high roads radiated, and their mileage was reckoned, similar to one in the Forum at Rome.

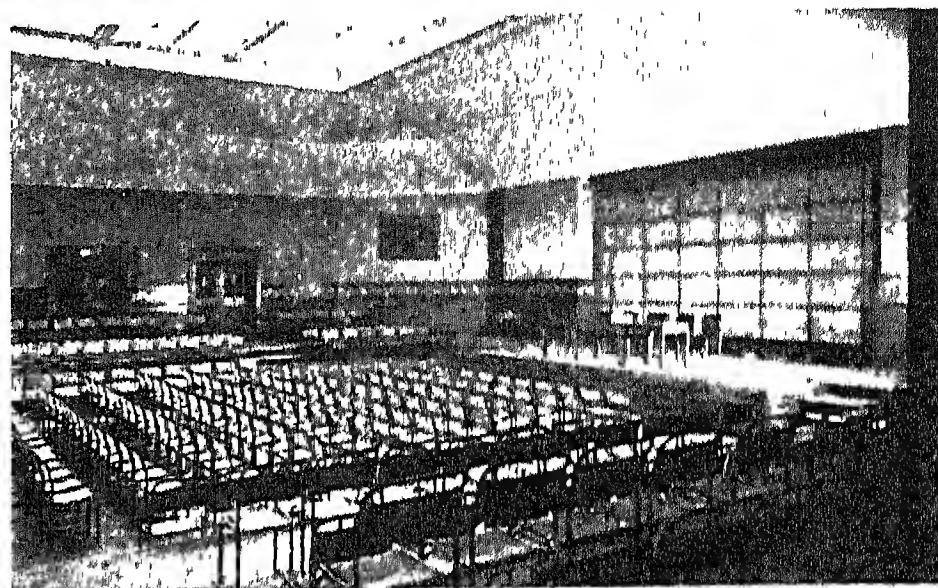
London Symphony. Name of two orchestral compositions. (1) Symphony No. 104 in F, the 7th

of the set composed in London by Haydn, was first performed in 1795. The thematic material of the final movement is based on the Westminster chime. (2) Symphony by Vaughan Williams, first performed at Queen's Hall, London, 1914. It suggests various moods of London.

London Transport. Organization responsible for the running of the passenger services of London, its full title being London Transport Executive. It is the name taken by the London Passenger Transport Board when that body became on Jan. 1, 1948, part of the nationalised transport system. The L.P.T.B. was formed by Act of parliament in 1933 under the chairmanship of Lord Ashfield to coordinate the underground rlys., tramways, trolley bus, omnibus, and coach services running within a radius of roughly 30 m. of Charing Cross, previously operated by 162 companies and local authorities. The principal objects in the formation of the board were to eliminate wasteful competitive services, and to improve passenger transport facilities in the area under its authority. The amalgamation included the London General Omnibus Co., the Metropolitan and Metropolitan District rlys., the London Electric rlys., and the L.C.C. tramways. The head office of London Transport is at 55, Broadway, London, S.W.1.

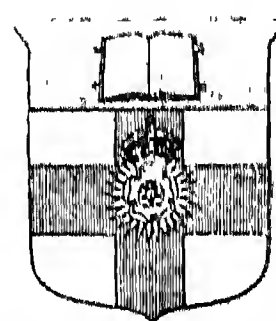
During the Second Great War the L.P.T.B. services ran through bombs, flying bombs, and rockets; 181 members of the staff were killed on duty, 1,867 were injured. Vehicles of the board were damaged on nearly 9,000 occasions.

London University. British university founded by royal charter in 1836. A movement to found a non-denominational university in London resulted in the opening in 1828 of an institution called London University (later renamed University College). A rival foundation, King's College, was established in 1831 by supporters of the Anglican Church. Neither institution had degree-giving powers; but by the 1836 charter a separate body, the University of London, was empowered to examine and confer degrees on candidates from these



London University. The William Beveridge room, in the great building in Bloomsbury. In this hall degrees are conferred. See also colour plate

two colleges and from other approved institutions. By an act of 1854 a medical degree of the University became recognized as a



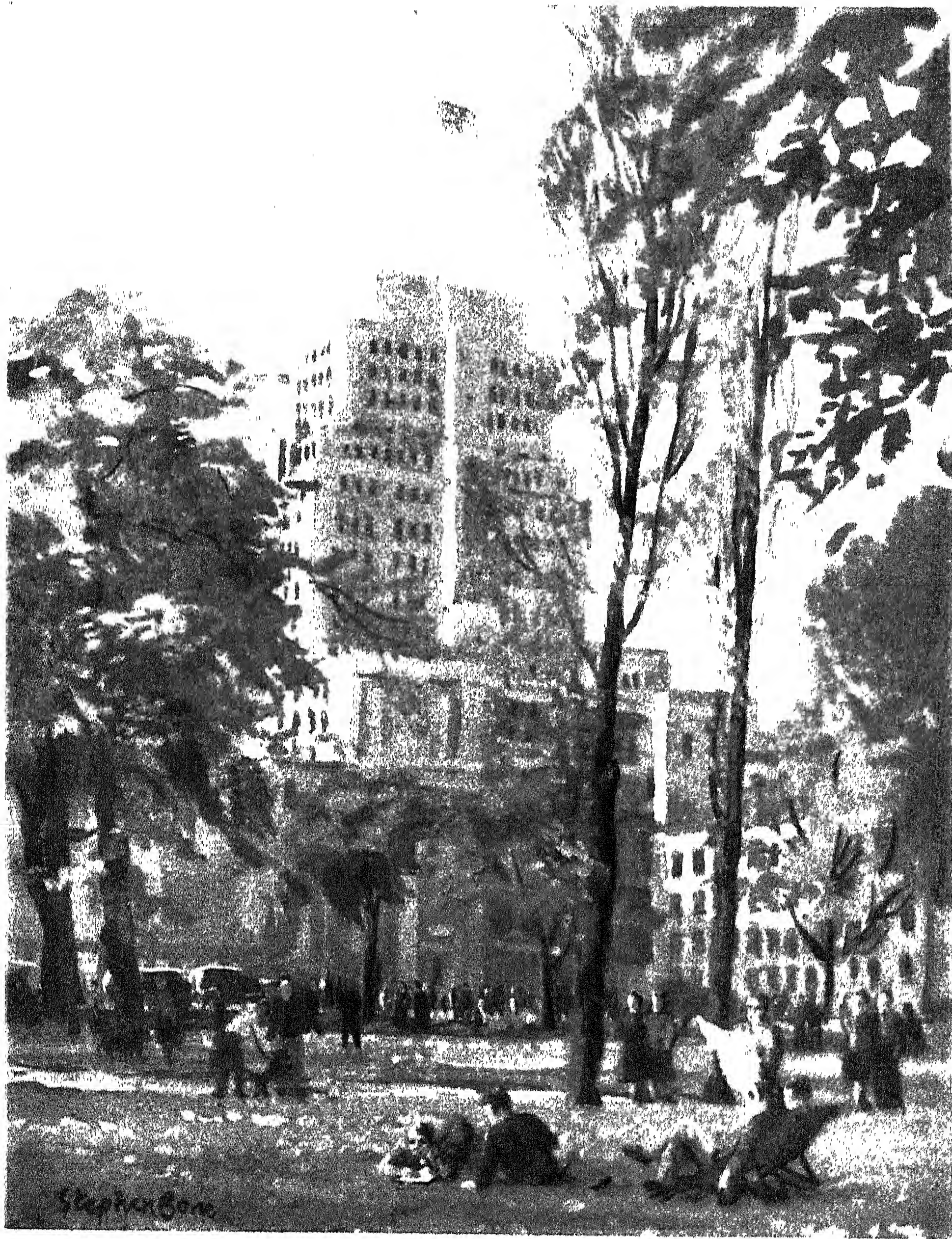
London University arms

licence to practise. In 1858 degree examinations were thrown open to any men candidates who has passed the matriculation examination.

The University opened its degrees to women in 1878, the first in Great Britain to do so.

A royal commission in 1894 recommended that there should be one University of London with teaching and examining functions. Under the University of London Act, 1898, and subsequent statutes a number of teaching institutions were admitted as "schools of the University" and their students became "internal students." Students admitted to the examinations of the University who had not attended courses of instruction at these "schools," or at certain institutions in London at which there were teachers recognized by the University, were termed "external students."

The following are the schools of the University: Bedford College, Birkbeck College, Imperial College of Science and Technology, King's College, London School of Economics and Political Science, Queen Elizabeth College, Queen Mary College, Royal Holloway College, Royal Veterinary College, School of Oriental and African Studies, School of Pharmacy, University College, Westfield College, Wye College; the medical schools associated with the following hospitals: Charing Cross, Guy's, King's College, London, Middlesex, Royal Dental, Royal Free, St. Bartholomew's, St. George's, St. Mary's, St. Thomas's, University College, Westminster; the British post-



The University of London was founded in 1836 with power to examine and confer degrees on students of the already existing University College and King's College. Under the University of London Act, 1863, it became in 1900 a teaching as well as an examining body. University College was incorporated in it in 1907, King's in 1910, and institutions lying within the county

of London and fulfilling the required standard of education were from time to time admitted as schools of the University. The Senate House, administrative centre of the University, is in Bloomsbury. Its tower, shown here in a reproduction of a painting specially made for the New Universal Encyclopedia by Stephen Bone, was completed in 1938; it is a London landmark

LONDON UNIVERSITY: THE TOWER OF THE SENATE HOUSE

graduate medical federation (fifteen specialist institutes); the London School of Hygiene and Tropical Medicine; the Lister Institute of Preventive Medicine; King's College Theological department, London College of Divinity, New College, Richmond College.

The University maintains a number of institutes, most of them for postgraduate students: the Courtauld Institute of Art; Institutes of advanced legal studies, archaeology, classical studies, Commonwealth studies, education, Germanic languages and literatures, historical research; the School of Slavonic and East European studies; and the Warburg Institute.

There are also a number of institutions with recognized teachers and some internal students of the University, including four colleges of technology and three colleges of music.

The senate governs the University in all academic matters while the finances and property are controlled by the court. Graduates of the University in convocation elect the chancellor and 17 members of the senate. The administrative centre of the University is the Senate House, W.C.1 (see colour plate). A site in Bloomsbury was acquired in 1927 and the main building, opened in 1936, also houses the university library and certain university institutes. The University owns additional property in the surrounding area zoned in the County of London Development Plan as the university precinct.

There are faculties of theology, arts, laws, music, medicine, science, engineering, and economics. In 1956-57 there were 22,610 internal students and 22,682 registered external students.

London Wall. London street behind the former City fortifications. It runs W. from Old Broad St., across Moorgate, to Wood St., and in the 16th century was popularly called "curriers' row" because a number of curriers lived along it. On it were the churches of St. Alphage, demolished in 1923, and All-Hallows-on-the-Wall, 13th century, rebuilt 1767. The wall of London was Roman in origin, and dated from the 2nd century A.D.; the bastions were a later addition. Repaired by Alfred and again at intervals during the Middle Ages, it was demolished during the 18th century. There are remains of the Wall, some of them brought to light after the bombing of the City during the Second Great War, in

the Tower of London; north of the Tower behind Trinity Place, where a fine piece is preserved showing the Roman work in its lower half, and the rampart walk at the top; in the church and churchyard of All-Hallows-on-the-Wall; at the west end of London Wall, in the former churchyard of St. Alphage, where the criss-cross brickwork and rampart walk of the time of Edward IV are visible. A medieval bastion on Roman foundations stands in the churchyard of St. Giles, Cripplegate, where the Wall turned S., and a short distance to the S. of this, but N. of Falcon Sq., is another. A Roman bastion and a piece of Roman wall lie under the centre of the yard of the G.P.O. A stretch of late Wall behind the gardens of Amen Court may be reached from Nos. 7 and 11 Old Bailey. The Wall crossed Ludgate Hill and reached the river near Printing House Square. The river front was fortified in Roman times, but not later.

Long. Loch of Scotland. An arm of the firth of Clyde, it extends for 17 m. in a N.N.E. direction between Argyllshire and Dunbartonshire. Its extreme breadth is about 2 m. A rly. runs N. from Garelochhead along its E. shore, past Arrochar at the head. During the Second Great War Loch Long was a training base for submarine crews and Commando forces.

Long, WALTER HUME LONG, 1st Viscount (1854-1924). British politician. Born at Bath, July 13, 1854, he was educated at Harrow and Christ Church, Oxford. He entered politics, being Conservative M.P. for N. Wilts 1880-85; for E. Wilts 1885-92; for the W. Derby div. of Liverpool 1893-1900; for S. Bristol 1900-06; for S. County Dublin, 1906-10; for the Strand div. of Westminster 1910-18; for St. George's, Westminster 1918-21.

As parl. secretary to the Local Government Board Long helped to formulate and get through the house the Local Government Act of 1888. He was president of the board of Agriculture 1895-1900, of the Local Government board 1900-05; then he was chief secretary for Ireland until the Liberals came to power in 1906. President of the Local Government board in



1st Viscount Long,
British politician

the 1915 coalition, he was transferred to the Colonial office on Asquith's retirement in 1916. First lord of the Admiralty 1919-21, he was created a viscount 1921 and died Sept. 26, 1924. He published *Memories*, 1923.

Long, George (1800-79). A British scholar. Born at Poulton, Lancs, Nov. 4, 1800, he was professor of Greek, 1828-31, and of Latin, 1842-46, at University College, London, and classical lecturer at Brighton College, 1849-71. Long was one of the founders of the Royal Geographical Society, edited the *Penny Cyclopaedia*, 1833-46, and started the *Bibliotheca Classica*. Among his publications are *Two Discourses on Roman Law*, 1847, translations of *The Meditations of Marcus Aurelius*, 1862, and the *Discourses of Epictetus*, 1877. He died on Aug. 10, 1879.

Long, Huey Pierce (1893-1935). U.S. politician, whose birthday is a public holiday in his native state. Born at Winnfield, La., Aug. 30, 1893, at 16 he became a travelling salesman. Later a lawyer, he was a member of the U.S. senate from 1925. Elected governor of Louisiana in 1928, he gained virtual control of that state. In 1934 the legislature passed 44 bills through all stages in 2 hrs. 20 mins.



Huey Long,
U.S. politician

A sinister instrument was the state bureau of criminal investigation, used by Long for political espionage. He brought under his personal control the legal system, militia, police, fire, and educational departments. To many classes he brought material benefits, but these were invariably bribes; and, although he thus increased the state debt to £35,000,000, he aroused little opposition, as he had relieved 70 p.c. of the pop. from taxation. In 1935 an association formed to overthrow his regime was disposed of by means of machine-guns.

Long decided to stand for the presidency, and started a "share the wealth" agitation which organized clubs in every state. These planned to limit personal fortunes to £200,000 and to guarantee £1,000 to "every deserving family." Becoming a bitter opponent of Roosevelt, he once spoke for 15½ hrs. in the

senate in an attempt to talk out the bill for continuing the national industrial recovery act. Due to be called before congress to answer charges that Louisiana was no longer administered by republican forms, he was, before the inquiry could begin, shot in the state house at Baton Rouge on Sept. 9, 1935, by Carl Weiss, a young physician, and died next day. Known by his nickname of "The Kingfish," Long was an astute politician, and possessed personal magnetism, but politically was little better than a gangster in office.

Long Acre. London thoroughfare. Running N.W. from Cranbourn Street to Drury Lane, W.C., and crossing Endell Street and Bow Street, it was first called The Elms and then Seven Acres. Coachmakers began to settle here in the 17th, and motor car makers in the 19th centuries. A large building at the S.E. corner of Endell Street, now a printing house, was originally built in 1847 as S. Martin's Hall, for John Hullah's chamber concerts; burnt in 1860, it was reconstructed in 1862; known 1867-75 as the Queen's Theatre; next became a gymnasium; and was then converted into business premises. On Jan. 28, 1918, the building, then occupied by Messrs. Odhams, was bombed during a night attack by German aeroplanes, 28 persons being killed and many injured. Cromwell, Nicholas Stone the sculptor, and John Dryden lived in Long Acre; Samuel Butler died in Rose Street at the S.W. end of this thoroughfare; and Taylor the Water Poet kept an alehouse in Hanover Court, formerly Phoenix Alley. The Covent Garden underground rly. station is situated in Long Acre.

Longan. Evergreen tree closely allied to the litchi (*q.v.*).

Long Beach. A city of California, U.S.A., in Los Angeles Co. Situated on the Pacific Ocean, 28 m. S. of Los Angeles, it is served by the Southern and Union Pacific rlys. and an airport. It was first settled in 1840, became a city in 1897, and is now the fifth largest city of California. An excellent harbour on San Pedro Bay which is protected by three breakwaters forms part of Los Angeles harbour and with it is the home port of the U.S. Pacific fleet. Deep-sea fishing and yachting are favourite sports here, and the tourist trade flourishes. Within the city limits is the Signal Hill oilfield, discovery of which in 1921 started the industry largely respon-

sible for the city's growth. Natural gas is also produced. Motor car, lorry, and aeroplane plants are also prominent among the city's industries. An earthquake in 1933 killed 120 persons and did to property damage estimated at £10,000,000. The pop., 2,252 in 1900, was 250,767 in 1950.

Longbenton or BENTON. Urban district of Northumberland, England. It is virtually a suburb of Newcastle-on-Tyne, lying 4 m. N.E. of it and connected by rly. Coal-mining and stone-quarrying provide occupation. Pop. (1951) 28,071.

Longboat. Heavily built rowing boat; the largest carried by a ship. It was also fitted with mast and sails, and was used for conveying heavy cargo in seas unsuited to smaller boats. The term is now almost obsolete.

Longbow. A military weapon, first employed on a large scale by Edward I. It retained its supremacy on the battlefield until the introduction of firearms. Adopted from the Welsh, it became the national weapon of the English and appears to have got its name from its size, approximately the same as that of the bowman, while the ordinary bow, which was discarded soon after the introduction of the longbow, was only 4-5 ft. long. The longbow, made generally of yew or ash, shot an arrow which was slightly lighter but far longer than the quarrel of the



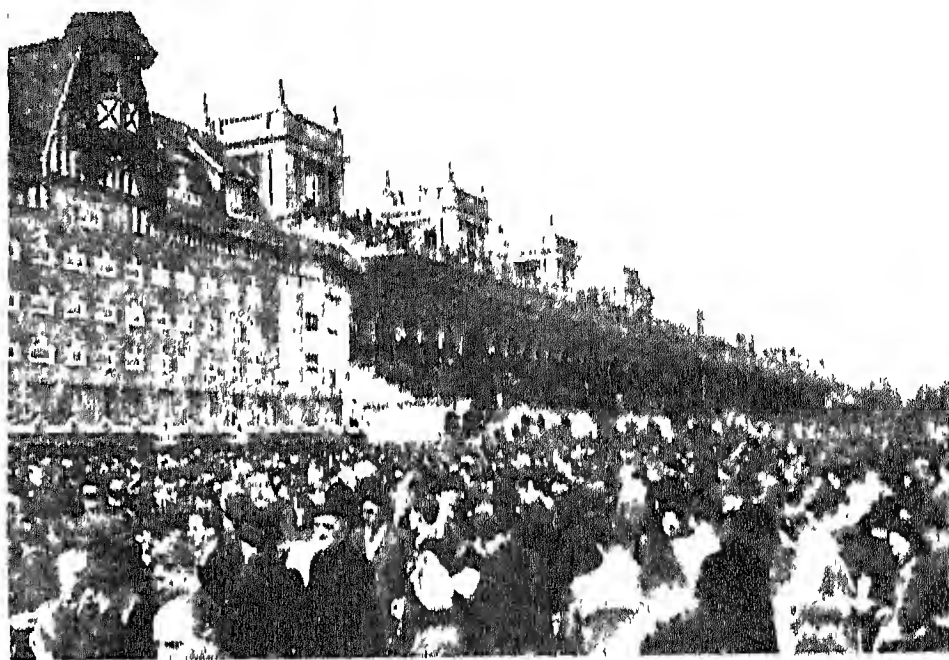
Longbow drawn ready for shooting

crossbow. It could be fired three times as fast as a crossbow, and the shafts could penetrate an oak door 4 ins. thick. See Arbalest; Archery; Arrow.

Long Branch. City of New Jersey, U.S.A., in Monmouth co. Situated on the South Shrewsbury river and on the Atlantic coast, it is 45 m. S. of New York, and is served by the Pennsylvania and the Central of New Jersey rlys. Long

Branch began to develop as a watering-place towards the end of the 18th century, and was chartered as a city in 1904. Four presidents of the U.S.A. have made Long Branch their summer capital. Pop. (1950) 23,090.

Longchamps or LONGCHAMP. French racecourse and review ground. It is in the Bois de Boulogne (*q.v.*), just outside the fortifications W. of Paris. The meetings,



Longchamps. View of the stands at the French racecourse just outside Paris in the Bois de Boulogne

which include that of the Grand Prix (*q.v.*), are notable for the display of fashions they attract. Near by are the remains of the abbey of Longchamps, founded by Isabelle of France in 1256, and notorious in the 18th century for the fashionable concerts which took place within its precincts in Holy Week. The abbey was suppressed in 1792. See Paris.

Longchamps, WILLIAM DE (d. 1197). English chancellor. He was born in Normandy, the son of Hugh de Longchamps, and entered the service of Prince Richard, afterwards Richard I, on whose accession he was appointed bishop of Ely and chancellor of England. His haughty contempt for everything English and his quarrelsome disposition aroused popular hatred against him, but he was an able man and loyal to the king. When Richard left England he made Longchamps custodian of the Tower and joint chief justiciar. Longchamps soon ousted his fellow justiciar, and by his appointment in 1190 as papal legate became supreme in the Church as well as the state. He arrested the archbishop of York and defied Prince John, but was himself arrested and imprisoned. Escaping to France, 1191, he joined Richard in his German captivity and was sent back to England, where he continued his obnoxious behaviour. Richard engaged him in further negotiations, finally sending him

on a mission to the pope, but he died on the way at Poitiers, Jan. 31, 1197.

Longcloth. Plain white calico of the best quality, and woven in pieces of exceptional length. It was first made in India, and sold in England as early as 1550. In 1700 the jealousy of English makers of linen and wool caused the import of longcloth and other calicoes to be prohibited; but the prohibition did not last long, and to the end of the 19th century it was the most popular substitute for linen in the making of underwear. It is now generally replaced by softer, thinner materials.

Long Eaton. Urban dist. and market town of Derbyshire, England. It is 7 m. S.E. of Derby and 7 m. S.W. of Nottingham, with rly. stations, Trent being the main one. The church of S. Lawrence is partly Norman. The chief industries are the manufacture of lace, elastic webbing and braiding, upholstery, hosiery, electric cable and wiring, metal tubing, and railway carriages. Long Eaton was a village until late in the 19th century, when some Nottingham lace manufacturers transferred their businesses here. It votes in South East Derbyshire. Market days, Fri. and Sat. Pop. (1951) 28,641. Little Eaton is a village 2½ m. from Derby, with a rly. station.

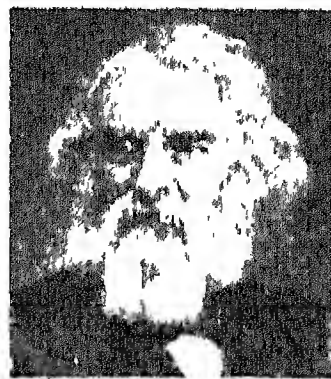
Longevity (Lat. *longævus*, aged). Long duration of life. It is difficult to place a limit to the length of life of many species of plants and animals, and even in man the three score years and ten is frequently exceeded, reputed cases of individuals living to double that age being on record, e.g. Thomas Parr, a labouring man of Shropshire, who died Nov. 15, 1635, in his 153rd year; and Henry Jenkins of Yorkshire, who died in 1670, aged 169.

The longevity of man is insignificant beside that of many plants

and animals. The baobab tree is known to have lived from four to five thousand years; the *Sequoia gigantea* of California to a similar period; the giant tortoise of the Galapagos Islands has a span of life of 200 years or more, etc. The duration of life, however, of most animals is less than that of man. Attempts to rejuvenate the old were made by S. Voronoff (*q.v.*), who grafted sexual glands of higher apes in man.

The factors which influence longevity are a matter of dispute. There is little doubt, however, that environment, especially in plants, has a great influence on the span of life, and in man environment and heredity. The average mean duration of life in man rose in the 19th century by over five years in most civilized countries. In France the increase has been more marked, the average duration of life at the beginning of the 19th century being only 29 years, while it is now over 40. The study of old age (gerontology) includes the scientific and social aspects. See Age; Life.

Longfellow, HENRY WADSWORTH (1807-82). American poet. Born at Falmouth, now Portland, Maine, Feb. 27, 1807, of early New England stock, he was educated at Bowdoin College, Brunswick, Maine. After studying law in his father's office, he became professor of foreign languages at Bowdoin, 1829-34; and professor of belles-lettres at Harvard, 1836-54. He visited Europe, 1826-29; 1835-36; 1842 and 1868-69, when Oxford and Cambridge conferred honorary degrees upon him. He was twice married, in Sept., 1831,



to Mary Storer Potter, who died at Rotterdam, Nov. 29, 1835; and in July, 1843, to Frances Elizabeth Appleton, the heroine of his *Hyperion*, who was burnt to death July 9, 1861, her dress having caught fire while she was sealing some packages of her little daughter's curls. Longfellow's 75th birth-

day was observed, especially in the public schools, throughout the U.S.A. He died at Craigie House, Cambridge, Mass., on March 24, 1882, and was buried at Mount Auburn. Emerson, then within a month of his own passing, looked on the face of the dead poet and said, "That gentleman was a sweet, beautiful soul, but I have entirely forgotten his name." A bust of Longfellow was placed in Westminster Abbey in 1884.

Longfellow's work was many-sided and voluminous. It included the writing of text-books, and was marked throughout by a deep sense of his mission as a teacher. His lyrical gift is remembered best by such poems as Hymn to Night, A Psalm of Life, The Wreck of the Hesperus, The Village Blacksmith, Excelsior, The Belfry of Bruges, Resignation, The Children, and Morituri Salutamus (We who are about to die salute you). His skill in narrative verse is seen in Paul Revere's Ride, King Robert of Sicily, and The Courtship of Miles Standish.

Of his longer works the more notable are *Evangeline*: a Tale of Acadie; and *The Song of Hiawatha*, an epic of the red man, which was set to music by Cole-ridge-Taylor. His dramatic works include *The Spanish Student*. The *Golden Legend* is the best part of the long dramatic poem *Christus*: a Mystery. His translations include a metrical version of Dante's *Divina Commedia*. Always influenced by boyish memories, he is also a poet of the sea.

A scholar, devoted from boyhood to study, Longfellow is a poet of feeling and sentiment rather than of thought and reason, with simplicity the chief characteristic of his work. His phrases are felicitous rather than profound. But he had the gift of imagery, and none has excelled him in narrative power. No poet was ever better beloved by his own people, and his circle of friends was wide and representative. His relations with the young are beautifully commemorated in Whittier's *The Poet* and *The Children*.

Bibliography. Works, Riverside Edition, 11 vols., 1886-90; Lives, S. Longfellow, 1886, new ed. 3 vols., 1891; E. S. Robertson, 1887; G. R. Carpenter, 1901; T. W. Higginson, 1902; H. Hawthorne, 1936; L. Thompson, 1939; *Evangeline*; the Place, the Story, and the Poem, Porter, 1882; *Poets of America*, E. C. Stedman, 1886.

Longford. Co. of the Irish Republic, in Leinster prov. Its land area is 403 sq. m. The sur-



Longfellow. The house in Portland, Maine, where the poet passed his early years

face is level, save in the N.W., but there is much bog land. The chief rivers are the Shannon, on the W. boundary, Inny, and Camlin. Longford has many lakes, including Lough Ree, on the border, and Gowna. The soil is mainly under grass, being used for rearing horses and cattle, but there are dairy farms. Longford is the county town; Granard and Ballymahon are other places. This wholly inland county is served by the Irish state rly. and by the Royal Canal. The co. combines with Westmeath to send five members to the dáil. Pop. (1951) 34,567.



Longford county arms



Longford arms

Longford. Town and urb. dist. of co. Longford, Irish Republic, also the county town. It stands on the Camlin, 76 m. W.N.W. of Dublin, with a station on the state railway. The chief building is the R.C. cathedral of S. Mel, a fine modern edifice; others are barracks, a market house, etc. The industries include a trade in agricultural produce, tanneries, and corn mills. Longford is the seat of the bishop of Ardagh. S. Idus founded a monastery here, and in 1400 a Dominican house was established. Longford became a town in the 17th century and sent two members to the Irish parliament. Pop. (1951) 3,857.

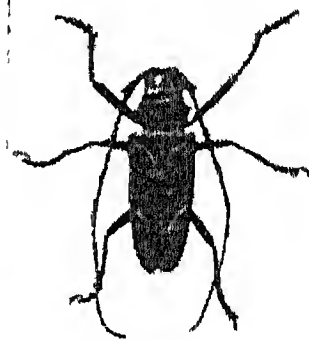
Longford. Village of Wiltshire, England. On the Avon, 3½ m. S.E. of Salisbury, it contains a castle, seat of the earl of Radnor, built in 1591 and restored in the 19th century. This mansion contains a magnificent collection of pictures.

Longford, EARL OF. Irish title borne since 1785 by the family of Pakenham. Thomas Pakenham (1713-76), an Irish M.P., was made a baron in 1756. In 1785 his widow was made a countess and was succeeded in 1794 by her grandson Thomas. He was made a peer of the U.K. as Baron Silchester in 1821, and his titles passed to his descendants. Thomas, the 5th earl, was killed in action at the Dardanelles, 1915. Edward, the 6th earl (b. Dec. 29, 1902), wrote plays produced in Dublin and London. His heir, created Lord Pakenham in 1945, was minister of Civil Aviation 1948-51.

Longhorn. Breed of British cattle, distinguished by the great length of the widely branching, drooping horns. Before the development of the shorthorn, this was the principal British breed, but it is now largely supplanted by its more fashionable rival. Its great value is for the production of cheese, as its milk is richer in curd than that of most dairy breeds. Apart from its great horns, it closely resembles the shorthorn in general build and colour, a white line down the back being another distinguishing point. Being of great size and weight, the longhorn yields much beef, and being of hardy constitution it is an easy animal to rear. See Cattle, colour plate.

Longicorn, OR LONG-HORNED BEETLE. Name given to a large group of beetles belonging chiefly to the family Cerambycidae and found wherever trees are abundant. Their antennae are usually much longer than the body, hence the name, and their bodies linear, often brightly coloured. Among them are some of the largest of all insects. The larvae feed by burrowing into the wood of trees, often causing much damage. About 60 kinds occur in Great Britain. Consult Insects of British Woodlands, R. N. Chrystal, 1937.

Longinus, DIONYSIUS CASSIUS (d. A.D. 273). Greek rhetorician and philosopher. Born at Athens,

Longicorn. Specimen of *Leptoderes fimbriata*

Longford, Wilts. The castle, restored in the 19th cent. seat of the Earl of Radnor

or Emesa in Syria, he became a pupil of Ammonius Saccas (q.v.) at Alexandria. In opposition to Plotinus, he maintained that ideas had a separate existence apart from the divine Nous or intelligence. Visiting the East, he became the intimate friend and adviser of Zenobia, the queen of Palmyra, after whose defeat and

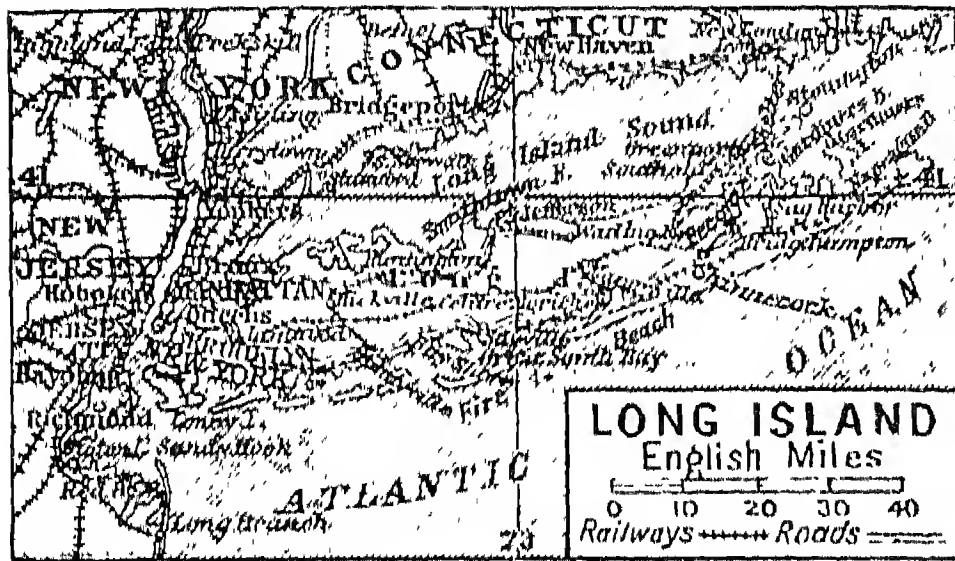
capture he was executed by the emperor Aurelian. A man of immense learning, he was the author of works on various subjects, only fragments of which remain. The famous treatise On Elevation or Impressiveness of Style, generally translated incorrectly On the Sublime, commonly attributed to him, is probably the work of an unknown writer of the 1st century of the Christian era.

Long Island. One of the Bahama Islands, in the N. Atlantic Ocean. It is 70 m. in length and very narrow, scarcely exceeding 3 m. in breadth. It lies between Watling Island and Exuma Island, in about lat. 41° 30' N. The chief settlement is Clarence Town. Pop. 4,564.

Long Island. A long, narrow island of the U.S.A., forming the S.E. extremity of New York state. Long Island Sound separates it from Conn. It is 118 m. long by 13 m. to 23 m. broad, and covers an area of 1,682 sq. m. Its surface is generally level except for a range of hills along the N. shore, which is indented by several bays, the largest being Smithtown Bay towards the centre. The inner S. shore is marked by Jamaica Bay, near the W. end, and the long, narrow Great South Bay, formed by an outer shore of beach ridges. The E. end of the island comprises two rugged peninsulas.

Long Island is divided into four counties, King's, Queen's, Nassau, and Suffolk, and at its W. extremity is the borough of Brooklyn and Long Island City, separated from Manhattan Island by the East river, only about ½ m. across. It is largely a residential district for New York business people and is served by the Long Island rly., which carries more season ticket holders than any other U.S. rly. Jones Beach, most frequented of many recreational areas developed in the neighbourhood, has in recent years usurped the popularity

of the old time resorts, Coney Island and Rockaway Beach, and Sheephead Bay is noted for its racecourse. In Queen's are the New York municipal airport, LaGuardia Field, which has the heaviest commercial airline operations in the world; and Flushing Meadow Park, site of the New York World's Fair of 1939 and



Long Island. Map of the island, forming part of New York State, and a residential district of New York City

of early meetings of the United Nations general assembly. Farther out, at Lake Success, the U.N. secretariat worked 1946-51, pending erection of the permanent headquarters on Manhattan.

Long Island was first settled in 1623. On Aug. 27, 1776, the British defeated the Americans in the battle fought at the W. end of the island. Pop. 4,600,022.

Long Island City. Part of the borough of Queens, N.Y.C., U.S.A. A separate city until 1898, it stands at the W. end of Long Island, on East River and Long Island Sound, and is the E. terminus of the Long Island rly. An increasingly important commercial and industrial centre, it has a river frontage of 10 m. Within an area of a few sq. m., 1,400 factories are grouped, their products ranging from bread to cut stone and marble. Settled in 1640, the city was created in 1870 by the consolidation of several villages.

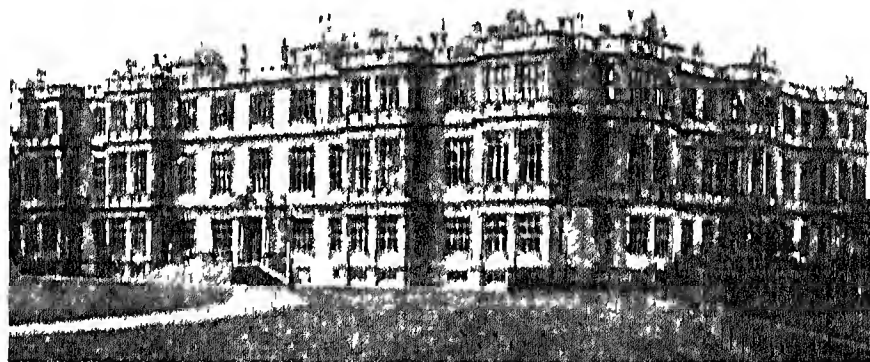
Long Island Sound. Channel separating Long Island from the N.Y. mainland and Conn., U.S.A. It communicates with the Atlantic through a strait called the Race, and at the W. end is connected with New York Bay by Hell Gate and East River. About 110 m. long, it has an extreme breadth of 24 m. and a greatest depth of 200 ft. Rivers flowing into the Sound from the N. include the Connecticut, Housatonic, and Thames. See Hell Gate.

Longitude. The number of degrees from the zero or prime meridian, measured along any parallel of latitude. The prime meridian is by international agreement that of Greenwich, so that places E. of that meridian are in E. longitude and places W. are in W. longitude. E. and W. longitudes meet at the meridian 180°. The rotation of the earth from W. to E. gives to places E. of Greenwich an earlier noon than to places W. Since the earth rotates through 360° in 24 hrs., a

difference of 1° long. corresponds to a difference of 4 mins. of time. See Latitude.

Longleat. Seat of the marquess of Bath, 3 m. from Warminster in Wiltshire. The house, on the site of the monastery of S. Radegunde, was built 1567-80 at the cost of Sir John Thynne

and after designs by John of Padua. Later Wren added something to it. Capability Brown remodelled the grounds, and in the 19th century it was "improved" by Sir Jeffry Wyatville. Built in the Italian style, it has a front 220 ft. long, and contains a massive hall and large portrait gallery. It has a collection of portraits by Holbein, Reynolds, Lely, Kneller, Van Dyck, and others. Around it is a park. 15 m. in circumference, through which the Frome flows.



Longleat, Wiltshire. South front of the mansion of the marquess of Bath

The Thynne family, who obtained the property at the dissolution of the monasteries, opened it to visitors in 1949. The name comes from the long leat or conduit that carried water to the monastery.

Longley, Charles Thomas (1794-1868). British prelate. Born at Rochester, July 28, 1794, he



Charles T. Longley, British prelate

was educated at Westminster School and Christ Church, Oxford. In 1818 he was ordained, and in 1823 was appointed vicar of Cowley, near Oxford. He remained at Christ Church, being tutor and censor 1825-28, and for a time university reader in Greek. Longley was in 1829 made headmaster of Harrow, which he left in 1836, to become first bishop of Ripon, where he remained twenty years. Then he was translated to Dur-

ham; in 1860 became archbishop of York; and in 1862 archbishop of Canterbury. He presided over the first pan-Anglican conference. He died Oct. 27, 1868.

Longmaid Process. In metallurgy, a method of recovering copper and silver from copper-silver ores, devised by William Longmaid, English chemist, in 1848. The ore is first roasted with salt to convert the metals into chlorides, after which the latter are dissolved out by water and weak solutions of hydrochloric acid. From these solutions the copper is precipitated by scrap iron, and the silver by zinc iodide, which is regenerated during the process, and the zinc used again. See Copper; Silver.

Longmans, Green and Co. London publishing firm. It was founded 1724 by Thomas Longman, of Bristol. He purchased the business in 1726 at the signs of the Ship and the Black Swan, Paternoster Row, from William Taylor. In 1826 it acquired The Edinburgh Review; in 1882 it started Longman's Magazine, which ran until 1905; and in 1886 it established The English Historical Review. Premises and stock were destroyed in the great German fire-raid of Dec. 29-30, 1940. Until 1947 the firm was housed in a London suburb, but then it returned to Clifford Street, W.1. See Coleridge, Wordsworth, Moore, Macaulay, Scott, Disraeli, Mill, Lecky, Morris, Spencer, Stevenson, Lang, Rider Haggard, Conan Doyle, Winston Churchill, and G. M. Trevelyan are among the prominent names in the Longmans catalogue.

Long Melford. A village of Suffolk, England. Situated 3 m. N. of Sudbury, it is a rly. junction for Haverhill and Cambridge. The church contains interesting monuments; the village is known from its association with Isopel Berners, George Borrow's heroine.

Longmore, Sir Arthur Murray (b. 1885). British Air Force officer. After going through his training in H.M.S. Britannia, Longmore became a naval officer and in 1912 joined the naval wing of the R.F.C. He reverted to sea



Sir Arthur Longmore, British air officer

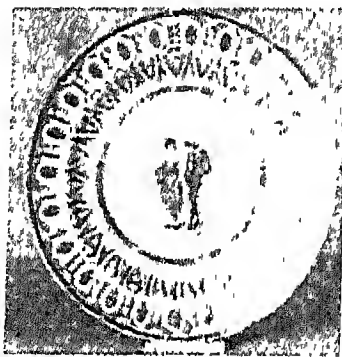
service in 1916 and was at Jutland, but returned to the R.N.A.S. the same year. In 1929 he was appointed A.O.C., R.A.F. College, Cranwell, and he commanded the coastal area 1934-36. Air chief marshal from Nov., 1939, he became A.O.C.-in-C., Middle East Command, in May, 1940, being succeeded by (Lord) Tedder in July, 1941. Longmore was then inspector-general of the R.A.F., retiring 1942. He was knighted 1935. In 1947 his book, *From Sea to Sky*, was published.

Longmyndian. In geology, the name given to a group of Pre-Cambrian sediments which form the Long Mynd near Church Stretton, Shropshire. The strata are subdivided into two groups, E. and W. The former is mainly shales and ashy grits, and rests on the Uriconian Volcanics which form Caer Caradoc, Wrekin. The W. group, largely grits and conglomerates, is considered by many to be much younger. See Pre-Cambrian.

Long Parliament. Name given to the English parliament which met on Nov. 3, 1640, sat almost continuously until 1653, and was revived in 1659. It met at a time of great excitement, when the country was thoroughly roused by the king's arbitrary acts. It secured the expulsion of bishops from the house of lords, passed an Act that it should not be dissolved without its own consent, and from 1642 to 1648 conducted the Civil War. In Dec., 1648, some of its members, 143 Presbyterians, were forcibly excluded, but the remainder, called in derision the Rump, continued in session. They set up the court for the trial of the king, abolished the house of lords, and carried on the government until April, 1653, when Cromwell turned them out.

In May, 1659, when there was no settled government in England, the Rump was restored; then the members were expelled, but soon restored again, this time with those kept out in 1648. On March 16, 1660, the parliament passed an Act declaring itself dissolved. From 1640 to 1653 its speaker was William Lenthall, while Pym, Hampden, Cromwell, and Hyde were prominent members of it. This parliament was, strictly speaking, an unconstitutional body after the outbreak of the Civil War, and its Acts from that date have no place on the statute book. See Cromwell.

Longport. Type of English porcelain. Earthenware was manufactured at Longport, near Burs-



Longport. Example from the Allen Collection, V. & A. Mus.

lem, Staffs, 1773. In 1793 Davenport produced a porcelain with hard, transparent body. His shapes and decorative treatment were good, and he produced many important royal table services, including the banqueting set for the coronation of William IV.

Long Primer. Name of an old printing type size, the modern equivalent of which is 10 point. It is a size larger than bourgeois and a size smaller than small pica, or about $7\frac{1}{2}$ lines to an inch. Great primer, or 18 point, is three sizes larger. Long primer is known in France as petit-romain; in Germany as Korpus or Garmond, after the French type-founder, Claude Garamond (d. 1561); in Holland as Garmond; in Italy as Garamone; in Spain as Entredós. See Typography.

Long Range Desert Group. Reconnaissance unit organized by Brig. Ralph Alger Bagnold to operate behind the enemy lines during the N. Africa campaigns of the Second Great War. Bagnold had led expeditions to explore the Libyan desert between 1925 and 1932 and written books about desert conditions. He went to the Middle East early in 1940 and, after some opposition, persuaded the War office to let him organize self-contained units to operate in the enemy's rear and gather information. At first a patrol consisted of two officers and thirty other ranks, accommodated in eleven 30-cwt. trucks. Armament comprised eleven Lewis guns, four Boys anti-tank rifles, and one 37-mm. gun, besides the crew's personal weapons. Later a patrol had one officer and 18 other ranks in five trucks, and the armament was altered to Browning, Vickers, and Breda guns.

The trucks were adapted to long desert journeys and equipped with spares and metal strips for negotiating loose sand. Each patrol was completely self-contained and carried sufficient food for an absence from base of three weeks and petrol for 1,100 miles. Further supplies of petrol, food, and ammunition were cached throughout the desert by a servicing unit. The first three patrols were manned by New Zealand divisional cavalry, but as the L.R.D.G. expanded

them, Staffs, 1773. In 1793 Davenport produced a porcelain with hard, transparent body. His shapes and decorative treatment were good,

volunteers were accepted from other British and Imperial units, until 17 patrols were operating.

On Sept. 5, 1940, the first patrol set out, and from then until the fall of Tripoli early in 1943 the group travelled thousands of miles behind the Axis lines, collecting information and harassing lines of communication. Latterly it worked in cooperation with the Free French from Chad territory. *Consult* *Born of the Desert*, M. James, 1945; *Long Range Desert Group*, W. B. K. Shaw, 1945.

Longreach. Town of Queensland, Australia. It is 428 m. W. of Rockhampton on the Thomson river, which drains into Lake Eyre. Its artesian bore makes it the chief stock-watering centre of the Thomson and Barcoo dists. Pop. 3,683.

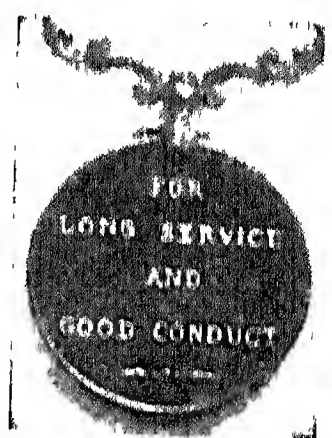
Longridge. Urban district of Lancashire, England. It stands on the N. bank of the Ribble, about 7 m. N.E. of Preston, with a rly. goods station. St. Lawrence is the parish church. Cotton and rayon manufacture are the chief industries. In the district are large waterworks belonging to Preston. A hill near is called Longridge Fell. Pop. (1951) 4,314.

Long Service and Good Conduct Medal. Award to personnel of the British and certain dominion and colonial armed forces, and to a number of civilian services.

ARMY. The Good Conduct Medal was first instituted by William IV in 1830 and granted to soldiers who had served with irreproachable character for 21 years in the infantry or 20 years in the cavalry.

At one time each dominion and colony maintaining armed forces issued its own medal with distinctive ribbon. These were replaced by the present army L.S. and G.C.M. instituted by Edward VII in 1910 and made common to

Great Britain and most dominions and colonies. Awarded to warrant officers, n.c.o.s, and men for 18 years' service with good conduct, it has on the obverse an effigy of the reigning sovereign in field marshal's uniform and on the reverse the words "For Long Service and Good Conduct." Ribbon, crimson with white edges. A title on the bar attached to the ribbon mount denotes the force in which the



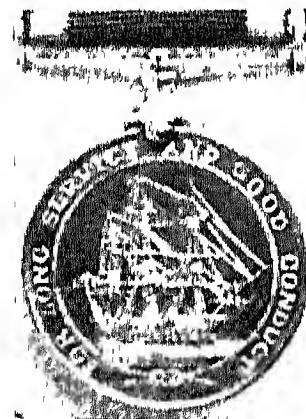
Long Service and Good Conduct Medal. Reverse of army medal

recipient served. Duty in wartime or in certain overseas garrisons counts double time.

The King's African Rifles L.S. and G.C.M. is the same as the British award, but with the inscription King's African Rifles on the reverse. The Royal West African Frontier Force L.S. and G.C.M. has similarly an appropriate inscription.

A Cadet Forces L.S. and G.C.M., instituted 1950, is granted to officers, chief petty officers, and adult warrant officers who have completed 12 years' continuous service with a navy, army, or R.A.F. cadet unit. Cadet service in wartime counts as double. Medal has on the obverse the royal effigy, on the reverse a torch. Ribbon is green edged with yellow with superimposed narrow stripes of dark blue, red, and light blue.

NAVY. The first L.S. and G.C.M. was instituted in 1831 by William IV; the present medal was authorised in 1848. It is granted to petty officers and men of the R.N. and to n.e.o.s and men of the R.M. who have served 15 years with good character, and carries a gratuity.



Long Service and Good Conduct Medal. Reverse of navy medal

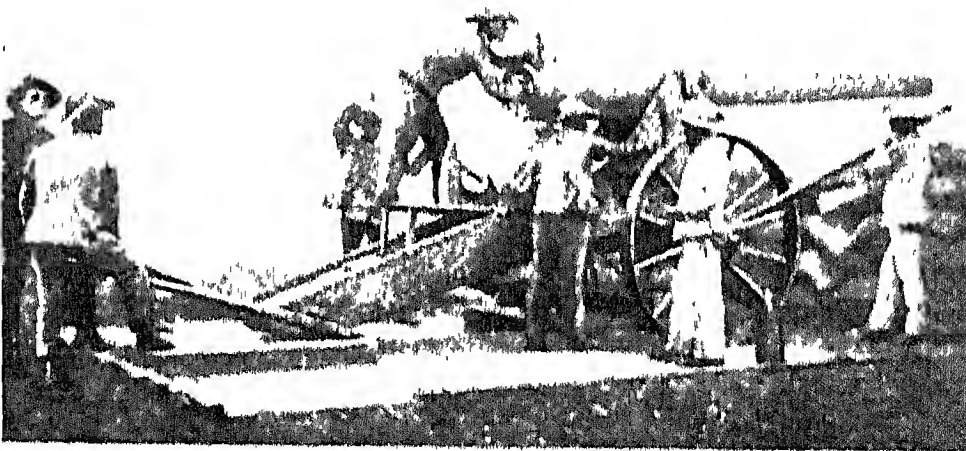
It has on the obverse the sovereign's effigy and on the reverse a ship-of-the-line at anchor surrounded by a cable with the inscription "For Long Service and Good Conduct." Ribbon is edged with white. Similar medals are awarded by the Australian and Canadian navies. L.S. and G.C. medals are granted to petty officers and men of the Royal Fleet Reserve (ribbon: white, blue, white, the blue and white being separated by a red stripe); Royal Naval Reserve (ribbon: dark green with white edges and a central white stripe); and R.N.V.R. (ribbon: blue, red, green, blue).

R.A.F. The medal dates from 1919 and is awarded to n.e.o.s and men with 18 years' exemplary service. It is of silver and bears on the obverse the royal effigy and inscription, and on the reverse an eagle surmounted by a crown surrounded by the words "For Long Service and Good Conduct." Ribbon is dark blue and crimson with white edges.

The Royal Observer Corps L.S. and G.C.M., instituted 1950, is granted to members of that

corps on completion of 12 years' satisfactory service. The obverse of medal has the sovereign's head; its reverse, a 16th-century coast-watcher standing beside a signal beacon and holding a torch; ribbon is dark blue, light blue, silver grey.

CIVIL. Authorised by royal warrant in 1951, the Police L.S. and G.C. medal is granted to full-time serving members of police forces in Great Britain, Northern Ireland, the Isle of Man, and the Channel Islands who complete 22 years' pensionable or approved service. The obverse has the sovereign's effigy; the reverse, the figure of justice with the inscription "For exemplary police service." Ribbon is dark blue bordered by white stripe with a superimposed line of dark blue. Special constables who have served for nine years in peace or five years in wartime, and have performed 150 police duties, receive the Special Constabulary L.S.M. This is of bronze with the royal effigy on the obverse and the name of the recipient on the reverse. The ribbon is red edged with one black and two white stripes. The London Salvage Corps gives a long service medal on completion of 15 years' unblemished service. The obverse has a kneeling fireman being crowned with laurel by a female figure, and the reverse the name of the recipient. The ribbon is maroon and light blue edged with white. The Colonial Police and Fire Brigades L.S. and G.C.M. was established in 1938, for award after 18 years. Its obverse shows the sovereign's effigy and the reverse a helmet and hatchet (firemen) or a wreathed truncheon (police). The ribbon of the police medal is



Long Tom. The Boer gun which bombarded Ladysmith during the siege, 1899-1900

blue, white, green, white, blue; that for firemen, blue, white, green, white, green, white, blue. The Coast Life Saving Corps L.S. and G.C.M. was instituted in 1911 for 20 years' service; on the obverse, royal effigy; on the reverse, re-

ipient's name; ribbon, azure with scarlet edges. See Medals, plate.

Longships. Number of rocks off Land's End, Cornwall, England. On one of them—Carn Brae—stands Longships lighthouse, with an occulting light visible for 16 m.

Long's Peak. Mt. in the U.S.A. Snow-capped peak in the Rocky mts. in Colorado, 50 m. N.W. of Denver, it is near the sources of the N. Platte and Colorado (Grand) rivers. Its height is 14,271 ft.

Longstop Ridge. Name given by British forces to Jebel Ahmera, N.W. of Medjez-el-Bab, Tunisia. It formed the right flank of the Axis troops holding Medjez-el-Bab in 1943, and was captured by the East Surreys and the Argyll and Sutherland Highlanders on April 26 after three days' hard fighting. See Tunisia, Battle of.

Longstreet, JAMES (1821-1904). An American soldier. Born in S. Carolina, U.S.A., Feb. 8, 1821, he was educated for the army at West Point, and first saw service against the Mexicans. In 1861 he joined the confederate army, and was soon in command of a corps. He led this in the first and second battles of Bull Run, at Fredericksburg, Gettysburg, and Chickamauga; at the last named his generalship was chiefly responsible for the victory. In 1864 he was again with Lee in Virginia, and was badly wounded. After the war he adjusted his differences with the northerners, becoming unpopular with the southerners. He was for a time minister to Turkey, and wrote accounts of his campaigns. Longstreet died Jan. 2, 1904.

Long Tom. Name given to a type of gun used by the Boers in the S. African War. These guns were 6-in. 94-pdrs., and originally intended for siege work. Adapted for field work, they were used against Ladysmith, Kimberley, and Mafeking. Their range was 11,000 yds.

Longton. Dist. of the city of Stoke-on-Trent, formerly a separate borough and market town. It has a rly. station. Chief buildings,

all modern, are the town hall and several churches; industries are the mining of coal and ironstone, and brewing and malting. Small until the introduction of the pottery industry in the 18th cent., Longton was made a borough in the

19th. In 1910 it was incorporated in Stoke-on-Trent, its pop. being then 38,000. *See* Stoke-on-Trent.

Longtown. A market town of Cumberland, England. It stands on the Esk, 9 m. N. of Carlisle, with a rly. station. The chief building is the 17th cent. Gothic church, and the chief industry the making of bricks and tiles. Population (1951) 7,204.

Longueville, ANNE GENEVIÈVE, DUCHESSE DE (1619-79). French princess. Daughter of Henri, duc



Anne Geneviève,
Duchesse de
Longueville

de Condé, she was born at Vincennes, where her parents were political prisoners, Aug. 28, 1619. At 23 she married the duc de Longueville, and her beauty, together with

the military prowess of her brother, the great Condé, gained her influence. Her marriage proved a failure, and it was during a liaison with the duc de la Rochefoucauld that she entered politics. She took an active part in the organization of the second Fronde rising in 1653, persuading her brother and Turenne to side with her party. But wearying of her ambitions and jealous of her intimacy with the duke of Nemours, Rochefoucauld cast her off and, after the death of her husband, with whom she had been reconciled, in 1663 the duchess retired to a Carmelite convent. A staunch friend of the Jansenists to the last, she continued to exert her considerable influence at court in their favour. She died April 15, 1679.

Longview. City of Washington state, U.S.A., and the co. seat of Cowlitz co. Situated at the confluence of the Cowlitz and Columbia, it was the earliest planned city in the Pacific N.W. and is now one of the world's greatest timber centres. Founded in 1922, Longview also processes, markets, and ships farm products. The Hudson's Bay co. built warehouses here in 1846-47 and in 1852 a convention met at the settlement of Monticello to divide Oregon territory in two. This settlement was washed away by floods in 1866-67. Longview bridge, constructed in 1930 to connect Washington and Oregon across the Columbia, has the largest cantilever bridge span in the U.S.A. Pop. (1950) 20,339.

Another Longview is a city of Texas, the co. seat of Gregg co.,

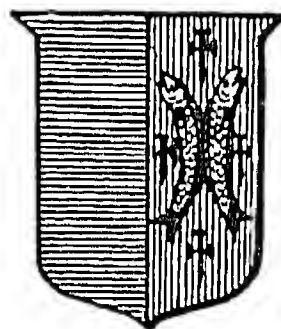
120 m. E. of Dallas. The principal industry is oil refining, through its proximity to the E. Texas oilfield, the world's largest. Population (1950) 24,502.

Longwall Working. One of the systems of working coal. By it coal is removed from the face continuously, leaving long walls, and the roof over the parts from which the coal has been removed is generally left to settle or fall in, haulage way only being maintained. *See* Coal; Mining.

Longwood.

Name of the residence at St. Helena where Napoleon lived. It obtained its name from the Longwood plains in the N.E. of the island. The house which was built thereon was prepared for Napoleon, and there he lived from soon after his arrival on the island in Oct., 1815 until his death, May 5, 1821. *See* Napoleon.

Longwy. Town of France. In the dept. of Meurthe-et-Moselle, it is 40 m. N.N.W. of Metz, on the

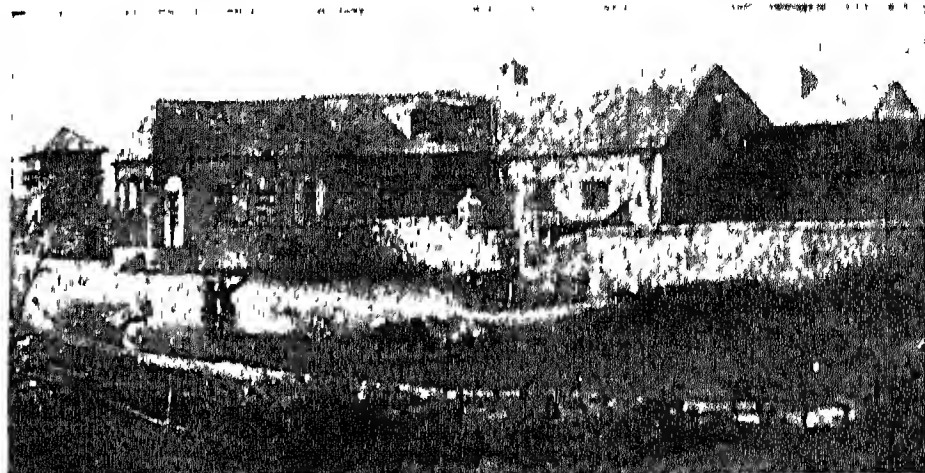


Longwy arms

Belgian frontier, and consists of an upper town on a steep rock, and a lower. In the latter various manufactures are carried on, and there are blast furnaces in the vicinity. Called by Louis XIV the iron gate of France, it commands the approach of the Chiers valley from Luxemburg. It stands on one of the routes which invaders from the N.E. have always taken, following the course of the Moselle trench to Luxemburg and thence into France. It is on a strategic rly., which the Germans seized at the outbreak of the First Great War, and possessed a fort, one of a chain of forts designed for the protection of the N.E. frontier of France.

In 1914 Longwy was garrisoned by two French battalions and a small force of artillery. The Germans attacked the town on Aug. 21, when the crown prince with the 5th army began his advance and opened the bombardment with heavy artillery. By Aug. 26 the Germans had put 36 out of 37 guns in the defences out of action, and the commander surrendered. Pop. 12,150.

Longyearbyen. Coal mining settlement on Spitsbergen (*q.v.*). The coal deposits were first developed under licence from the Norwegian govt. in 1909 by an American, John Longyear, after whom the settlement was named. A yearly average of 300,000 tons of coal is produced. The pop. of 600 consists almost entirely of miners and auxiliary workers, most of whom migrate regularly from Norway for the season. A governor has administrative and



Longwood, St. Helena. The house where Napoleon passed the last years of his life during exile on the island

From a print c. 1840

legal authority. The original settlement was destroyed by the Germans in the Second Great War, but was rebuilt and resumed coal exports in 1946.

Lonsdale, EARL OF. A British title borne with a short interval since 1784 by the Lowthers. The family dates back to the time of Edward I or earlier, and in Tudor times the Lowthers were important in Cumberland. In 1696 Sir John Lowther was made a viscount. He was a supporter of the Revolution of 1688, after which he was first lord of the treasury. The title became extinct when his younger son died in 1741.

The existing branch of the Lowthers is descended from Sir Christopher (d. 1617). Sir James (1736-1802) inherited the great wealth of Viscount Lonsdale and of other Lowthers, including another Sir James, enriched by the development of Whitehaven. He was made an earl in 1784, but the earldom died with him. A kinsman, Sir William, became Viscount Lowther; made earl of Lonsdale 1807, he built Lowther Castle, Penrith, 1806-1807, chief seat of the family until demolished in 1957.

In 1882 the title passed to Hugh Cecil Lowther, 5th earl (1857-1944). He was

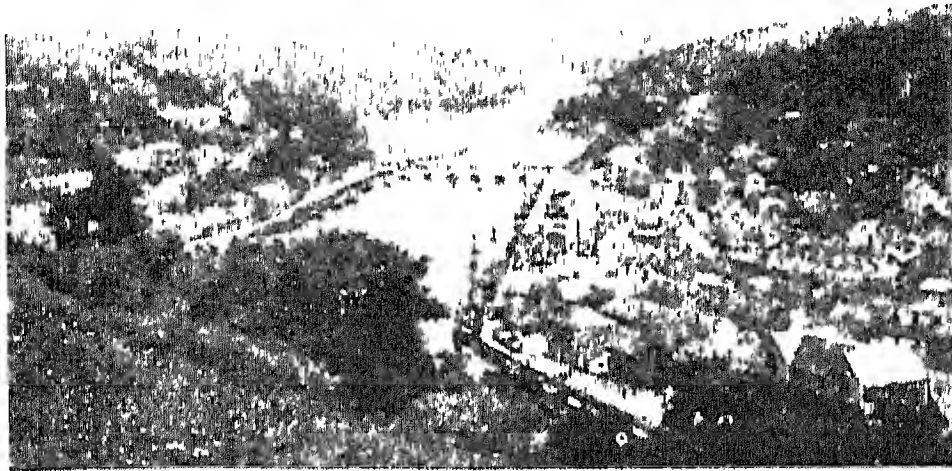


5th Earl of Lonsdale,
British sportsman

born on January 25, 1857, was educated at Eton, and became devoted to sport and adventure. In 1878 he led an expedition to the Arctic and discovered gold in Klondike before the boom. He rode in steeplechases, was master of famous packs, won the St. Leger with Royal Lancer in 1922, and was a picturesque figure on the racecourse. In 1923 his father took the Waterloo Cup. President of the National Sporting Club, in 1911 he awarded gold belts for boxing at five weights. Dying childless on April 13, 1944, he was succeeded by his brother Lancelot (1867–1953), on whose death his grandson James (b. 1922) became 7th earl.

Lonsdale, Frederick. Pen-name of Frederick Leonard (1881–1954), British playwright. Born in Jersey Feb. 5, 1881, he made a reputation as the librettist of musical comedies, e.g. *The Balkan Princess*; *The Maid of the Mountains* (*q.v.*). This was eclipsed by his fame as the author of sophisticated, witty comedies of social life, adroitly characterised and deftly put together. These included *Aren't We All?* 1923; *Spring Cleaning*, 1923; *The Last of Mrs. Choyney*, 1925; *On Approval*, 1927; *Canaries Sometimes Sing*, 1929. But for the *Grace of God*, 1947, was more serious. He died in London, April 5, 1954.

Lons-le-Saunier. A town of France, capital of the dept. of Jura. It lies on the river Vallière, 56 m. by rly. S.W. of Besançon, and is a rly. junction of note. There is trade in mineral waters, wine, timber, and agricultural produce, and the town's salt baths are resorted to for rickets and other ailments. The principal buildings are the prefecture, formerly a convent, the hôtel de ville, with a small museum, and



Looe, Cornwall. Town and harbour, with the bridge connecting E. and W. Looe, looking inland from Frith

the 12th–15th cent. church of S. Désiré. The town was the birthplace of Rouget de Lisle (*q.v.*). Pop. (1954) 15,030.

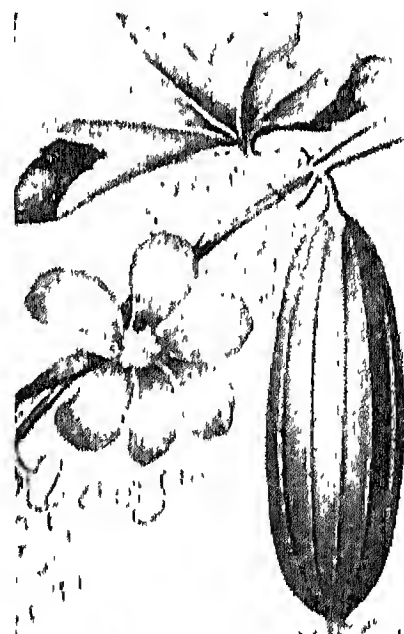
Loo. A card game. Three-card loo may be played by several persons, 5 or 7 making the best game. He who cuts lowest deals, giving three cards, one at a time, to each player. An extra hand, termed a miss, is also dealt, which the eldest player may exchange for his own, but if he looks at the miss he must take it or be looted. So long as the miss remains on the table any player may take it in his turn. Each dealer puts a certain stake into the pool, which is also increased by penalties. The card left at the top of the pack is turned for trumps, but when the pool contains only the minimum amount the round is usually played without trumps. The knave of clubs, known as Pam, is the principal card.

The first player looks at his cards and decides to play his own hand, take the miss, or drop out; the next player doing in like manner; and this continues till it is seen how many players stand the pool. The eldest hand then leads a card, and the next player must, if possible, either beat the trick by a higher card or trump it. Each player's card is left in front of him as played; the winners taking a third of the pool for each trick and those players who have not won a trick are looted, by having to pay a certain stake into the next pool, making it, with the dealer's contribution, a double.

Looe. Seaport, holiday resort, and urban dist. of Cornwall, England. It stands on Looe Bay, 16 m. W. of Plymouth, terminus of a branch rly. from Liskeard. The

urban dist. includes East Looe and West Looe, which are connected by a long bridge across the river Looe. The main buildings are the parish church of S. Martin, which has a Norman doorway, the restored chapel of S. Nicholas, and the old town hall. Industries are shipping, fishing, and fish canning. The two Looes are ancient places, and were at one time flourishing seaports; the tidal harbour is still used by the small fishing fleet. Privileges were granted to them in the 14th century, and in 1558 E. Looe became a corporate town. W. Looe obtained a like distinction later, and then the two began to send members to parliament. In 1832 the right to separate representation was taken away, and later the privileges of both boroughs were lost. Off the mouth of the river is Looe Island, once a haunt of smugglers. Market day, Sat. Pop. (1951) 3,801.

Loofah (*Luffa cylindrica*). A climbing herb of the family Cucurbitaceae. A native of Africa, it has long stems that climb by means of tendrils. The alternate leaves are large, rough, five-lobed. The flowers are white, the females distinct from the males. The fruit is long, like a cucumber, but stouter. The flesh is permeated by a network of tough fibres, and when the flesh is macerated this is left intact and forms the bath loofah.



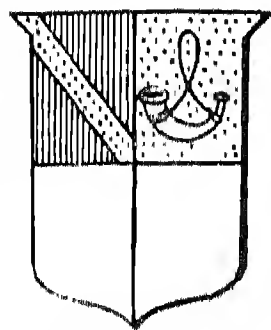
Loofah. Leaf, flower, and fruit

Looking Backward, 2000–1887. Utopian romance by Edward Bellamy (*q.v.*) first pub. 1888. The hero, put

into a mesmeric sleep in 1887, wakes up over a century later to find the world reorganized on a socialist basis with the aid of all kinds of mechanical invention. Among other happy prophetic strokes, Bellamy depicted the flooding of a private house with music or the performance of a concert, drama, or oration, all at the turn of a switch.

Lookout. Mountain ridge in the U.S.A. It extends from the N.W. corner of Georgia to the Tennessee river, and thence S.W. into Alabama, and is noted for the grandeur of its scenery. It reaches 2,125 ft., and is traversed by a rly. See Chattanooga.

Loom. Apparatus for weaving cloth. Some looms are operated by hand, some by power. The hand loom has now only a limited



Lons-le-Saunier arms

application in village industry and handicraft work; its development is dealt with under Weaving. The power loom on which most of the woven fabric of the civilized world is made is a complicated machine. Looms are specially designed to do certain work; thus a loom built to make cotton sheeting would not be suitable for crêpe-de-chine, still less for velvet or towelling.

The basic parts of the power loom are, as for the hand loom, the beam on which the warp is wound, and from which it passes to the shafts, frames set with wire healds each with a central eye, so that by raising a shaft all warp threads passing through heald eyes on that shaft are raised simultaneously; the shuttle, carrying a bobbin of weft backwards and forwards across the warp; the sley, an oscillating frame carrying a comb-like wire reed for pressing the weft threads up against their predecessors; and the take-up roller, on which woven cloth is wound.

The cycle of operations for a simple weave is as follows:—the shafts lift all odd threads and leave all even threads lying on the shuttle-race; the shuttle is given a violent jerk by a flexible wooden rod with a rawhide thong attached to the end; the sley moves backwards and presses the newly-inserted weft in place; then moves forwards, and at the same time the shafts controlling the odd

threads lower them to the race, and those controlling the even threads lift these: the weft shuttle is returned, and the second pick of weft "beaten up" against the first. At the same time, the take-up roller moves the cloth on the distance of one pick, and a similar length of warp is released from the beam at the back.

Looms can be divided into three types, depending on the means used for raising and lowering the shafts. The Tappet is light and fast, but can be used only for comparatively simple weaves. The Dobby will accommodate up to 48 shafts, and on it elaborate weaves such as herringbones can be woven. Mechanism controlling the lifting of the shafts is contained in a box. The Jacquard has no shafts, but each warp thread passes through a separate heald hung on a cord, and can be lifted independently. The lifting is controlled by a series of feeler wires working in conjunction with holes punched in cards, rather like player-piano rolls; Jacquards are slow and tedious to set up, but are used for elaborate work such as damask.

In the ordinary loom the operator has to watch for shuttles running empty and to replace them. In the automatic loom a feeler mechanism brings a shuttle-change into operation when a shuttle is nearly empty, the old one being pushed aside and a full one put in its place. The operator's only duties are to see that there is a reserve of full shuttles, and to repair breaks when there is a stoppage. One man can look after eight or more machines.

Special looms are required for chenilles; pile fabrics such as velvets; carpets; and towelling. In most of these, a second and independent weft or warp forms a series of raised loops over wires; in towellings these loops are left intact, but in velvets and carpets the wires are forged into knife-edges at the end, and as they are withdrawn by the loom mechanism

they cut the loops, leaving the pile. More cumbersome looms are used for weaving asbestos belting, brake linings, etc.

Ribbons, tapes, and webbings are woven on smallware looms, usually large structures really consisting of about a dozen looms side-by-side. The shuttle is not thrown backwards and forwards, but is positively moved by rack and pinion; this is possible because for a tape an inch wide the shuttle can be 10 ins. in length, whereas for a 100 inch calico the shuttle would have to be about 9 ft. long for a positive drive. A newer smallware loom is the Unit type: its shuttle works in a semi-circular track, while the shafts and sley are replaced by two fittings like metal combs with teeth facing and capable of overlapping.

Modern developments include circular looms, which insert the weft in a continuous spiral, and so form a tubular fabric; and shuttleless looms, with nippers to pull the weft across the cloth from a large bobbin. These machines do not at present constitute any serious threat to the orthodox type. *Consult Automatic Weaving, W. A. Hanton, 1929.*

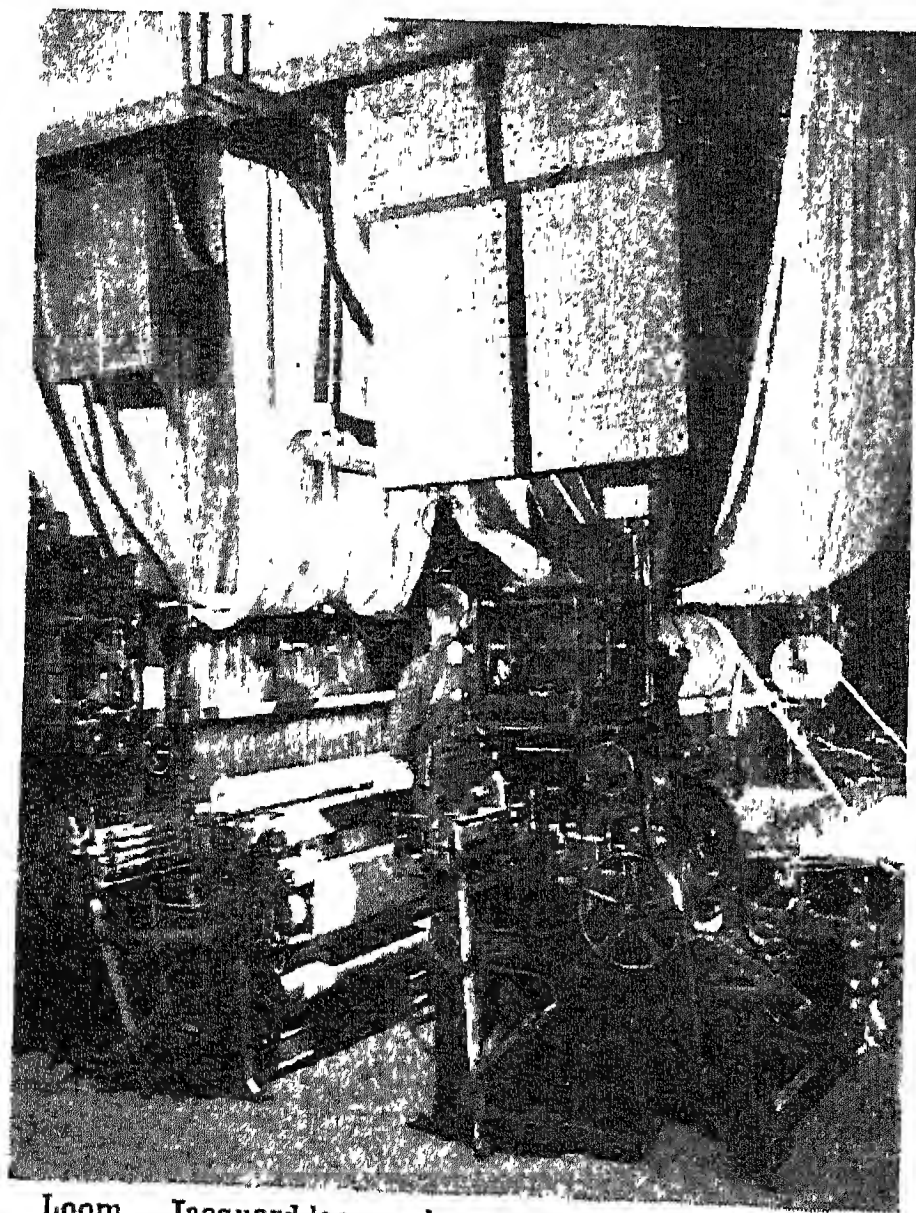
F. V. DAVIES, A.R.I.C.

Looming. Nautical expression for an enlarged, and often indistinct, appearance of an object. This magnifying process frequently occurs with slight fog over the sea or near the coast, and is due to the refraction of light in the surface layers of the atmosphere. *See Mirage.*

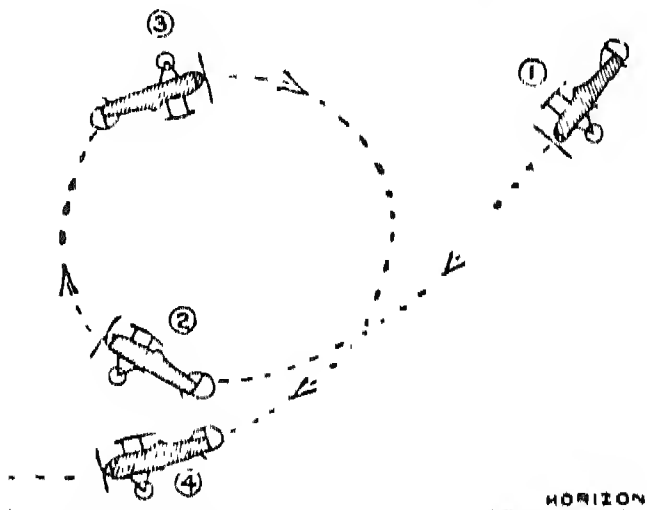
Loon (also loom, from old Norse *lóm*). Name applied popularly in Scotland to the great northern diver (*q.v.*). In N. America the name is given to several similar diving birds of the genus *Chia*.

Loón. Town and harbour of Bohol, Philippine Islands. It lies on the W. declivity of a hill in which steps have been cut to enable the town to be approached. The harbour is protected by a mole 100 yds. in length. Loón trades in local produce, chiefly cocoa, coffee, maize, tobacco, and coconuts. *Pron. Lo-ôn.*

Looping the Loop. Aerobatic manoeuvre, involving a complete revolution in flight in a vertical plane. In the normal loop, the upper surface of the aircraft is on the inside of the circle; the opposite is true of the inverted or outside loop. The term is derived from a fun-fair "thrill" popular in the early 20th cent., a development of the switchback railway in which the passengers



Loom. Jacquard loom, a large machine used for weaving elaborate fabrics such as damask



Looping the Loop. Diagram showing successive positions of an aeroplane during a loop

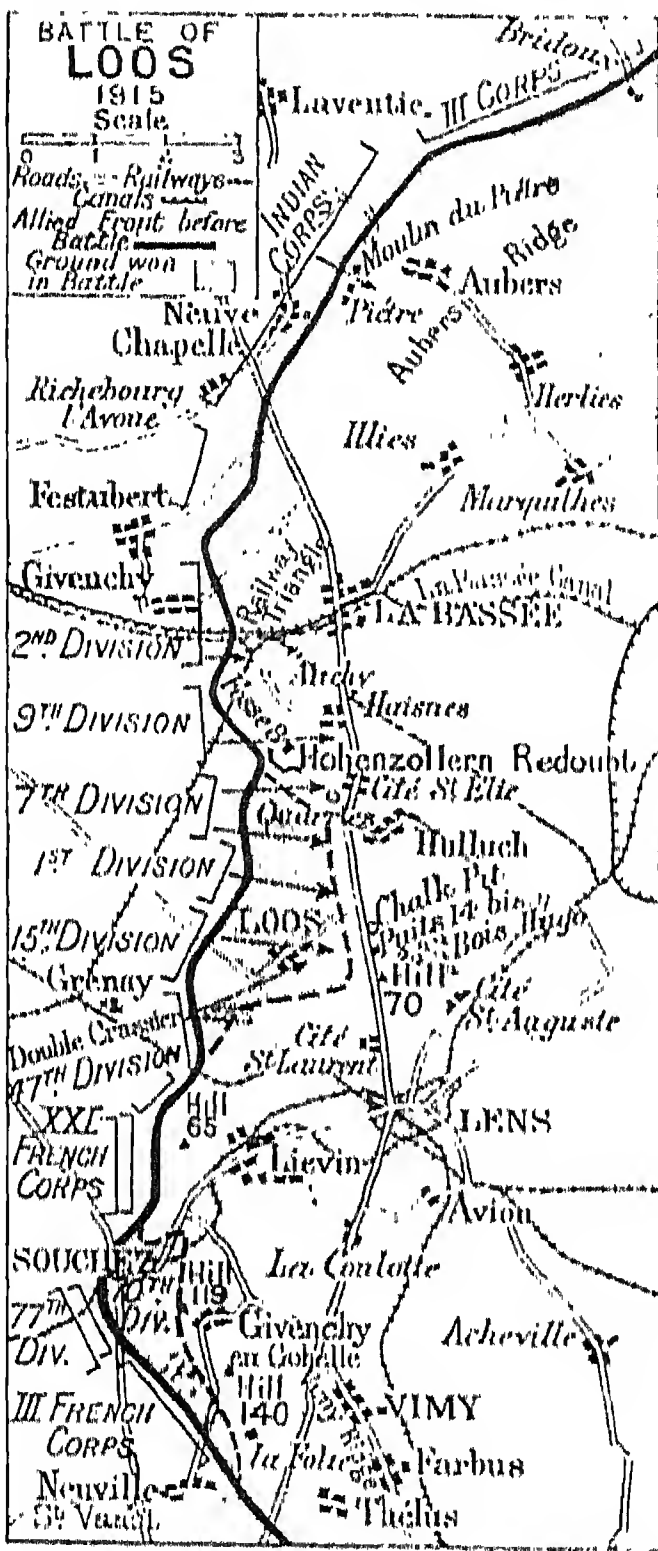
car followed the rails through a complete loop. The first man to loop the loop, Adolphe Pégoud (1887-1915), did so on Sept. 1, 1913, in a Blériot monoplane.

Loos-en-Gohelle. Mining village of France, in the dept. of Pas-de-Calais, 3 m. N.W. of Lens. As the result of the fighting around it in the First Great War it was obliterated, but a new village was built, with a memorial to over 20,000 missing British soldiers.

The village is famous for the battle of Loos, an engagement of the First Great War. This was one of the earliest large-scale Allied offensives against German forces on the western front, Sept.-Oct., 1915. The attack was timed to coincide with a French offensive in Champagne, and its object was to recover from German hands the mining district and the town of Lens, and possibly Lille if the initial attack were successful. The battle was notable as being the first time the British new armies, raised in 1914, were employed in offensive warfare, and the first occasion on which gas was used against the Germans. As it happened, the latter proved a handicap to the British, as the wind shifted just as the gas was released from the cylinders.

The German positions, which included the so-called Hohenzollern Redoubt, Hill 70, and Fosse 8, were of great strength; and the battle was preceded by heavy artillery bombardment of these positions, lasting four days. The attack began in the early hours of Sept. 25, on a front of over 20 m. Troops taking part were the British 1st, 2nd, 7th, 8th, 9th, 15th, and 47th divisions, and the Indian corps, with the 21st and 24th divs. in reserve; and to the immediate S., two French corps and two French divisions. The German positions were deeply penetrated in some places, but wire and machine guns had soon checked the attack elsewhere.

The 15th and 47th divs. both entered Loos, the former forcing a way right through the village. By noon the situation was that British reserves might have clinched a signal victory; but the reserves were too far from the front, which they could not reach before night-fall, by which time the Germans had counter-attacked strongly. The French, attacking at midday, had gained some ground. Heavy fighting raged for the next two days. New attacks by the British 21st and 24th divs. met with no



Loos. Plan of the battlefield showing relative positions of Allied divisions

success in the face of machine-guns and gas shells. There were many German counter-attacks, but by Sept. 28 the battle had come almost to a standstill. While the French took over the Loos sector, at Sir J. French's request, and the Allies were consolidating their new front, the Germans made several local attempts to recover ground, notably at the Hohenzollern Redoubt, which the British 9th div. had stormed the first day. There was severe fighting for the Redoubt between Sept. 29 and Oct. 8, and part of its tangle of trenches was re-occupied by the Germans

The net result of the battle was the Allied gain of a salient towards Lens with a depth, at its deepest point, of about 3,500 yards, together with the village of Loos and Souchez and the W. slopes of Vimy Ridge. The British force engaged had been about 250,000, the French almost as large. British losses, 47,000 during the first three days, probably finally exceeded 60,000. Individual battalions suffered grievously, e.g. of the 9th King's Liverpool only 5 officers and 120 men were left. German casualties were smaller than those of the Allies. The attempt to pierce the German front where it was strongest might have succeeded had the Germans been surprised and had ample Allied reserves been available. Neither of these conditions being fulfilled, the struggle, after the initial success, resolved itself into a series of ill-supported and ill-concerted attacks on German machine-gun positions under heavy fire. The heroism of the troops on both sides was remarkable. Few battles have ever been more desperately contested. Apart from the official war histories, vivid descriptions of the battle are to be found in *The First Hundred Thousand*, Ian Hay, 1915; *Realities of War*, Sir P. Gibbs, 1920; *Peter Jackson*, Cigar Merchant, G. Frankau, 1920; *The Great Push*, P. McGill, 1916.

Loosestrife. Folk name applied to several plants, but especially to *Lysimachia* (common loosestrife) and *Lythrum salicaria* (purple loosestrife), both tall herbs found on river banks. Common loosestrife (*Lysimachia vulgaris*) is a herb of the family Primulaceae. It has lance-shaped leaves, and yellow flowers in clusters at the top of the stem. Purple loosestrife, family *Lythraceae*, has narrow leaves and purple or pink flowers, forming handsome spikes. It is often mistaken for willow herb (*q.v.*).



Loosestrife. Flower spray of purple loosestrife

Lope de Rueda (c. 1510–65). Spanish dramatist. Born in Seville, and a gold-beater by trade, he became a pioneer of the popular Spanish drama, writing prose plays which Cervantes, who calls him "the great Lope de Rueda," witnessed in his youth. The ablest member and manager of a small company of players, he displayed much ability in the representation of roguish servants, Biscayan boors, etc., travelling from town to town with crude properties and costumes, and performing in a wagon. More popular were his short pastoral dialogues and interludes, interspersed with songs. His plays were usually drawn from Italian sources. He was buried in Córdoba cathedral.

Lope de Vega (1562–1635). Spanish dramatist and poet, whose full name was Lope Felix de Vega Carpio. He was born in Madrid, Nov. 25, 1562, and educated at the imperial college and the university of Alcalá. As a soldier, he took part in the Armada expedition against England, and he belonged to the same regiment as Cervantes. He eloped with and married a lady of the court, but after killing an opponent in a duel he spent some years in banishment from Madrid. After the death of his second wife, in 1614 he took holy orders, became a member of the order of S. Francis, and was a familiar of the Inquisition. He amassed honours and wealth, enjoyed universal popularity, and dying in Madrid, Aug. 27, 1635, was buried in the convent of Jesus and Mary.

Called *El Fenix de España*, the Spanish phoenix, he wrote nearly 2,000 plays, religious dramas, and interludes, of which 430 plays and 50 autos, or religious dramas, are extant. The chief founder of the national drama of Spain, he introduced the drama of intrigue, familiarly known as that of the cloak and sword. His best known plays include *La Carbonera*, *Bella Aurora*, *Noche de San Juan*, and *Por el Puente Juana*. While in contemporary England women's parts were being taken by boys, Lope assigned them to women. Despite the vastness and variety of his output—probably no more prolific writer has ever lived—he wrote spirited dialogue, displayed infinite invention, and had a won-

derful gift for drawing pictures of manners from real life.

His other works embrace epics, poems, and prose romances. He wrote a long continuation of Ariosto's *Orlando Furioso*—*Hermosura de Angélica*, 1602; *La Dragontea*, 1598, an epic attacking Drake and Queen Elizabeth; in rivalry with Tasso, a poem of 20 cantos entitled *La Jerusalén Conquistada*, published 1609; a religious poem, *San Isidro*, 1599, on the patron saint of Madrid; *La Corona Trágica*, 1627, an epic on Mary Queen of Scots; *Arcadia*, 1598, a pastoral romance in prose and verse; a long novel, *El Peregrino en su Patria*, 1604; and a religious pastoral, *Pastores de Belén*. He also composed sonnets of merit. See *Drama*; *Spain*; *Literature*.

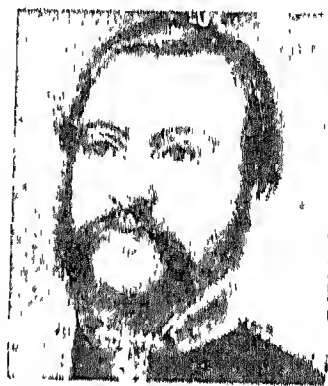
Bibliography. Works: Edition in 21 vols., 1876–79; definitive edition, 1890–1920; *Some Account of his Life and Writings*, Lord Holland, 1817; *L. de V. and the Spanish Drama*, J. Fitzmaurice-Kelly, 1902; *Life*, 1904, and *The Spanish Stage in the Time of L. de V.*, 1909, H. A. Rennert.

Lopes, Sir Manasseh Masseh (1755–1831). British politician. Of Spanish-Jewish descent, he was born in Jamaica, Jan. 27, 1755. Becoming a Christian, he was elected M.P. for New Romney in 1802, and was created a baronet three years later. In 1819 he was tried for corruption, and it was found that he had bribed the electors of Barnstaple with £3,000 and those of Grampound with £2,000 for seats in those constituencies. Fined £1,000 and sentenced to two years' imprisonment for the latter offence, upon his release he was elected for his pocket borough of Westbury. He died March 26, 1831, leaving a large fortune.

Lopez, Carlos Antonio (1790–1862). Dictator of Paraguay. Born at Asunción, Nov. 4, 1790, his early knowledge and grasp of public affairs aroused the hostility of his uncle, J. G. R. Francia, then dictator of Paraguay, and he was forced into obscurity until Francia's death in 1840. By 1844 he had become president, governing nominally under a republic constitution, but actually as an autocrat. His rule was sagacious, and was chiefly directed to developing the resources, both material and military, of the country.

His son, Francisco Salano Lopez, born at Asunción, July 24, 1826, was educated in Paris, and in 1845 was appointed commander-in-chief of the Paraguayan army. In 1854 he

was sent on a diplomatic mission to Europe and on his return was made minister of war. President from



F. S. Lopez, dictator of Paraguay

the death of his father, he was almost constantly at war with Brazil, Argentina, and Uruguay. His cruelty in the wholesale execution of suspected men alienated many supporters. Driven to the N. of Paraguay by the victorious Brazilians, he was overtaken near the river Aquidaban and killed, March 1, 1870. A study by R. B. Cunningham Graham appeared in 1933. *Pron.* lo-payth.

Lopez, Vicente Fidel (1814–1903). Argentine author. The son of Vicente Lopez (1781–1856), one of the founders of the republic, he was born in Buenos Aires and became a lawyer. Fearing the dictator Rosas, he fled to Chile, and at Valparaiso founded in 1842 one of the first reviews published in that country. He returned to Argentina in 1852 to become head of the university at Buenos Aires. Among his writings, all in Spanish, are *The Bride of the Heretic*, or *the Inquisition of Lima*; *The Race of Peru before the Conquest*; *History of the Argentine Republic*.

Lop-nor or **Lob-nor**. Lake-system of China, in Sinkiang prov. Situated between the Kuruk and Altyn ranges, it collects the drainage of the Tarim basin. Described in early Chinese annals and visited by Marco Polo about 1273, its former sites are now desiccated, salt-encrusted desert. Since the 17th century the Tarim has discharged more southerly and westerly into the reed-grown Karakoshun lagoon.

Lopokova, Lydia (b. 1892). Maiden and professional name of the Russian-born ballerina who married J. Maynard Keynes. Born Oct. 21, 1892, she studied at the imperial ballet school, St. Petersburg, and performed at the Mariinsky Theatre in *The Sleeping Princess*, 1901. She became a famous dancer in Paris and New York before making her London debut in 1918 with Diaghilev's company, of which she was for a time prima ballerina. Outstanding in grace and technique, she created the characters of Columbine in *Carnaval*, and the can-can dancer in *La Boutique Fantasque*, and her brilliant sense of comedy was



Lope de Vega, Spanish dramatist



Lydia Lopokova, Russian dancer, in *The Good-Humoured Ladies*

probably at its best in *The Good-Humoured Ladies*. As an actress she gave notable performances in Shakespeare, Molière, and Ibsen. She married J. M. (Lord) Keynes (*q.v.*) in 1925.

Lopolith (Gr. *lopos*, basin). In geology, a large basin-shaped intrusion of igneous rock. The mass may originally have been a thick sill which, as the magma reservoir below emptied, sagged centrally, thus taking the present shape. Important lopoliths include the Bushveld area of Africa, and the Sudbury norite in Canada; with the latter are associated world-famous nickel deposits.

Lopping. Term in England for the ancient right of cutting forest trees for firewood. While woodland was subject to rights of common of pasture, the lopping right was often vested in the lord of the manor. In Essex, by a right known as "the common of estovers," residents of the villages of Epping Forest had the privilege of cutting wood within reach of the axe every year between Nov. 11 and April 23, by virtue of a grant from Queen Elizabeth I as lady of the manor of Loughton (*q.v.*). By the 1860s the right was confined to Loughton and Theydon Bois. When the forest was secured for the public the loppers were compensated partly by a grant, partly by the formation of a lopping endowment charity, and by the building at Loughton in 1883 of the public Lopping Hall. The pollarded condition of the vegetation in the forest is due to the custom. Consult London's Forest, P. J. S. Perceval, 1909.

Loquat (*Eriobotrya japonica*). Japan quince or medlar. An evergreen shrub or small tree of the family Rosaceae, it is a native of Japan and S. China. Its large, oblong, and wrinkled leaves are downy on the underside. The white flowers are in drooping sprays, and the orange-red, downy fruit hangs in clusters. Its flavour is much like that of a sharp apple, but the fruit is not edible until about May.

Lorain. City of Ohio, U.S.A., in Lorain co. At the mouth of the Black river, on Lake Erie, 25 m. W. of Cleveland, it is served by the Baltimore and Ohio and other rlys., and by lake steamers. It has a good harbour, from which a shipping trade in coal, iron, lumber, etc., is carried on. The steel industry on which the city's economy is based became important in 1894 when Tom Johnson brought his works here. Incorporated in 1836 as Charleston, Lorain received its present name in 1874, and became a city in 1896. Pop. (1950) 57,202

Loraine, Robert (1876-1935). British actor and airman. Born at New Brighton, Jan. 14, 1876, he went on the stage at 13, and soon played small parts for George Alexander at the St. James's Theatre, London. His John Tanner in *Man and Superman* (*q.v.*), New York, 1905, and his Bluntschli in *Arms and the Man*, 1908, proved him a foremost Shavian actor. Other parts included Charles Surface in *The School for Scandal*; the lead in *Cyrano de Bergerac*; Rassendyl in *The Prisoner of Zenda*; Mirabel in *The Way of the World*; Simon and his son in *Mary Rose*. Loraine was the first to cross the Irish Sea in an aeroplane, 1910, and served with distinction in the R.A.F. during the First Great War. He died Dec. 23, 1935.

Loranthaceae. A family of evergreen shrubs, parasitic upon trees, and natives of the tropical and temperate regions. The usually opposite leaves are leathery, yellowish green or olive brown. In some species the sexes are combined in one flower, in others they are separate. They have no petals, and are succeeded by berries, each containing a single seed. Not all the species are out-and-out para-

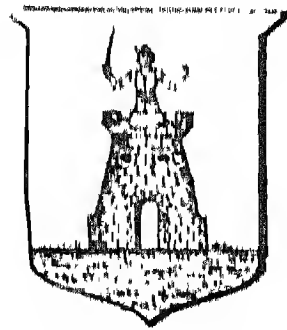
sites. Those, like the European mistletoe, that have green leaves, merely absorb water and salts from the sapwood of the tree and elaborate these materials (with



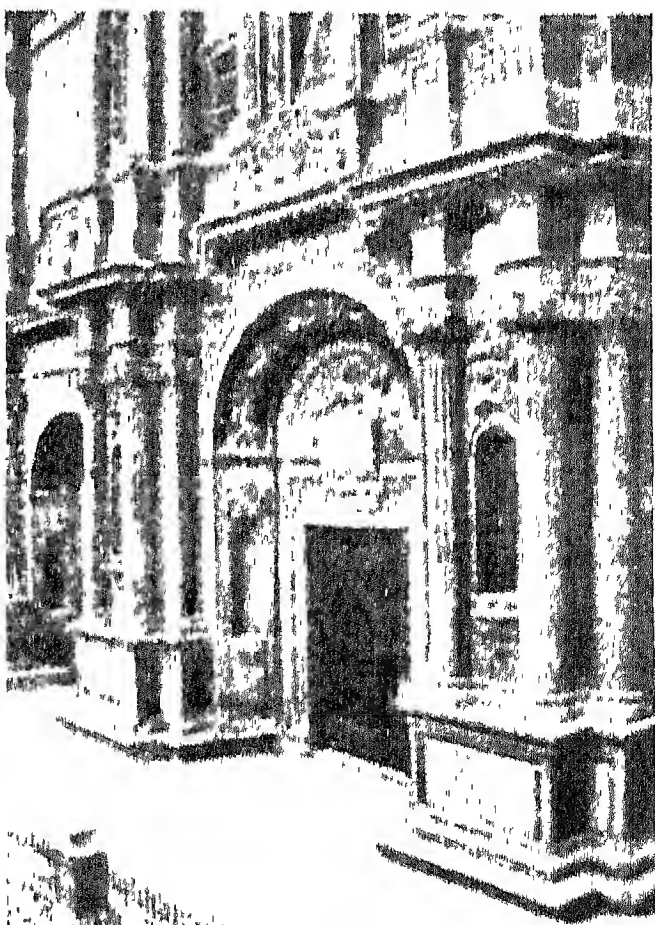
Loquat. Foliage and flower sprays of the Japan quince; inset, flower

carbon from the atmosphere) into food. Some species of *Loranthus* are almost leafless.

Lorca. Town of Spain, in the prov. of Murcia. It stands on the river Sangonera, 41 m. by rly. S.W. of Murcia. Crowned by a Moorish castle, the old section of the city is crowded on the slope of a hill; the modern part, with broad streets, fine squares, law, courts, town hall, hospitals, theatre, etc., lies on the plain. Lorca cathedral is a Gothic structure, dating from the 12th cent. Gunpowder, chemicals, porcelain, woollens, and leather are manufactured; there is a trade in wine, agricul-



Lorca arms



Lorca, Spain. Façade of the church of S. Patricio

tural produce, and cattle. In the vicinity are silver and lead mines. Lorca figured prominently in the wars of the Moors. In 1802 thousands perished through the bursting of its huge irrigation reservoir. Pop. (1950) 70,998.

Lorca, FEDERICO GARCÍA (c. 1898–1936). A Spanish poet and dramatist. The date of his birth is unknown.

He was born in Fuentevaqueros, Granada, and in youth was a friend of De Falla (*q.v.*), with whom he shared a love of Andalusian folk music and dancing. During 1919–28 he lived in Madrid and Granada, and in 1930 went to New York. He was assassinated by fascists in Granada at the outbreak of the Spanish Civil War.

A truly popular modern poet, Lorca had an important influence on his contemporaries, for the emotional forces he released became part of the revolutionary movement. It was said that "he summoned the traditions, tragedy, and suffering of his own life to face, fight, and overcome death." His first collection of poems was published in 1921, and his best-known lyrical work, *Romancero Gitano*, in 1928. Poems inspired by his unhappy New York experiences, *El Poeta en Nueva York*, appeared posthumously. Among his plays were *Mariana Pineda*, 1927; two great tragedies, *Bodas de Sangre*, 1933, and *Yerma*, 1934; *Doña Rosita la Soltera*, 1935. *Bodas de Sangre* was translated into French as *La Maison de Bernarda* by J. M. Créach, and into English as *Blood Wedding* by Roy Campbell. A selection of Lorca's poems translated by S. Spender and J. L. Gili was published in 1939. *Consult Life*, A. Barea, 1944.

Lord (A.S. *hláford*, from *hláf*, loaf, bread; and probably *weard*, warden, keeper). Originally meaning master of a household, hence generally master, ruler, nobleman, or man of high official rank; title applied specially in Great Britain to peers and various dignitaries. The general sense occurs in landlord, lord of the manor, and the Scottish laird.

As applied to God the word is used to render the Hebrew *Yahveh* (Jehovah) and *Adonai*, Gr. *Kyrios*, and Lat. *Dominus*. As a special

title the word lord is never given to other than British persons. It is applied to peers of the realm (lords temporal and spiritual), and may be substituted for the legal or courtesy titles marquess, earl, viscount, or baron, the following "of" being omitted, but is never given as a title to a prince or a duke. Lord is nearly always substituted for baron. By courtesy it is prefixed to the first name and surname of younger sons of dukes and marquesses. Every bishop of the Church of England, diocesan or suffragan, and every Welsh bishop consecrated before the disestablishment, is styled the lord bishop, unless retired. See Address, Forms of.

Lord Advocate, OR QUEEN'S (KING'S) ADVOCATE. Principal law officer of the crown in Scotland. As head of the administration of criminal justice, he acts as public prosecutor, and pleads in all causes that concern the crown. Almost invariably an M.P., before the creation of a secretary of state for Scotland he was responsible for all parliamentary business relating to that country. The office of lord advocate was established early in the 16th century.

Lord Chamberlain. Chief officer of the British royal household. His actual precedence in relation to the lord steward depends upon the relative rank of the persons holding the two offices. The symbols of his office are a white staff and a key. He is in charge of all the household above stairs, and appoints the royal physicians and tradesmen. All state ceremonies are in his care. He is a peer and a privy councillor. With some exceptions he licenses the London theatres, and those at Windsor and Brighton, and at other places when visited by the sovereign. In 1624 the lord chamberlain replaced the master of the revels as licenser of plays; all plays given publicly in Great Britain must be licensed by him under the Theatres Act, 1843. A queen-consort has a separate lord chamberlain's department.

Lord Chancellor. See Lord High Chancellor.

Lord Chief Justice. Name given to the judge who in England presides over the king's (queen's) bench division of the high court of justice. He ranks next to the lord chancellor, the president of the chancery division. There was a justiciar in England very early, and in the time of Henry II a lord chief justiciar or justice. At first the highest officer of state, a kind of prime minister, he was later confined to his legal duties, and became president of the court of king's (queen's) bench (*q.v.*). Until 1873 there was also a chief justice of the court of common pleas. In the U.S.A. the chief justice is the president of the supreme court.

Lord Great Chamberlain. The sixth great officer of state in England. As the name chamberlain suggests, he was originally in personal attendance on the sovereign, but many of his duties have lapsed. He still has charge of the palace of Westminster and of the arrangements when the sovereign opens parliament, and is in evidence at a coronation, when he claims as part of his perquisites the bed in which the sovereign slept the night before the ceremony. In 1133 the hereditary office was granted to Aubrey de Vere. In 1952 the 5th marquess of Cholmondeley was chosen as lord great chamberlain for the reign of Elizabeth II.

Lord High Chancellor. Highest judicial functionary of Great Britain. He is a cabinet minister, a privy councillor, and relinquishes office on a change of government. The lord high chancellor, keeper of the great seal, and as such of the sovereign's conscience, may not be a Roman Catholic. He issues the royal commissions for the opening and proroguing of parliament, and for giving assents to bills, and reads the sovereign's speech in the sovereign's absence.

The chancellor appoints all justices of the peace, some of the high court, and all county court judges, makes rules for carrying out the Summary Jurisdiction Acts, and issues all writs. He is president or speaker of the house of lords, his seat being known as the woolsack, and *ex officio* its president when it is the supreme court of appeal. He takes precedence immediately after the archbishop of Canterbury, receives a salary of £10,000 per annum, and is entitled to a pension of half that amount on relinquishing office. As ex-chancellor he is *ex officio* a judge of the house of lords. There was a lord high chancellor



Federico Lorca,
Spanish poet



Lord Chamberlain
in court uniform

for Scotland until 1707. *See* Chancellor; Chancery; Lords, House of; Woolsack.

Lord High Commissioner. Representative of the sovereign at the general assembly of the Church of Scotland. His presence gives the sanction of the civil authorities to the assembly's deliberations. The office is normally filled by a Scotsman of distinction. *See* Scotland, Church of.

Lord High Steward. First great officer of state in England. He waited at the royal table on certain feast days, then only at coronations, and later presided at the trials of peers. The last permanent steward was Thomas, duke of Clarence, d. 1421. The office is now revived only for a coronation or the trial of a peer.

Lord Howe. Island in the S. Pacific belonging to New South Wales. It is 300 m. N.E. of Sydney. Mountainous and precipitous, its highest point reaches 2,840 ft., and it covers 5 sq. m. Lord Howe is also the name of a group in the Solomon Is.

Lord in Waiting. Personal attendant on the British sovereign. He is invariably a peer belonging to the political party in power, and as such leaves office on a change of government. Usually seven in number, these lords attend on the sovereign in turn. A queen-consort has sometimes a lord in waiting, not a political office. *See* Royal Household.

Lord Keeper. In England, until about 1760, one of the great officers of state. He was the keeper of the great seal, originally only as a deputy of the lord chancellor during the absence of the latter abroad, or pending the appointment of a lord chancellor, but in course of time his office was made permanent, and included the work of affixing the seal to documents.

Lord-Lieutenant. Official representing the sovereign. There is one for every county in the U.K., usually a nobleman with estates therein. The lord-lieutenant is appointed by the sovereign by patent under the great seal. His original duty was to raise a defence force under a commission of array on the occasion of disorders, and this survives in his office as president of the county T.A. association. He is usually *custos rotulorum*, or keeper of the records, for the county, and recommends the names of persons for appointment as magistrates. Before the creation of the Irish Free State in 1922 there was a lord-lieutenant of Ireland. *See* County.

Lord Mayor. Title of the chief magistrate of the City of London and of other English cities. It is



Lord Mayor of London in his robes

commonly assumed to have been first bestowed upon the mayor of London in 1354 by Edward III, though it is doubtful if the prefix "Lord" was ever formally conferred. The lord mayor of London is elected at Michaelmas, and sworn into office on Nov. 8, is addressed as right honourable, and on state occasions in the City ranks next to the sovereign. His wife is called the lady mayoress. The mayor's court, a survival of the courts of record, was absorbed into the City of London court in 1920. Other English cities in which the mayor is known as the lord mayor are Birmingham, Bradford, Bristol, Coventry, Hull, Leeds, Leicester, Liverpool, Manchester, Newcastle-upon-Tyne, Norwich, Nottingham, Plymouth, Portsmouth, Sheffield, Stoke-on-Trent, York. *See* Mayor; Provost. *Consult* London, W. J. Loftie, 1887.

Lord Mayor's Show. Procession to mark the installation of the lord mayor of London, when on or about Nov. 9 he proceeds in state to and from the law courts, to receive the sovereign's assent to his election. The first lord mayor's show was held in 1215, and the first by water in 1453. The Puritans suppressed the show for 16 years. After 1711, when the lord mayor was thrown from his horse, a coach was used. An elaborate coach, with panels by the Italian painter Cipriani, was employed from 1757 till 1896, when it was replaced by a copy. The medieval procession has been succeeded by a pageant, usually representative of some feature of the British Commonwealth—e.g. sport in 1916, agriculture in 1917. At the Guildhall banquet on the night of the show the prime minister makes an important speech, traditionally dealing with foreign policy.

Lord of Appeal. Persons qualified to sit in the house of lords when it acts as a court of appeal are mentioned under Law Lord. *See also* Appeal, Courts of.

Lord of Misrule. Name given to a lord of the revels in the Middle Ages. He is also generally known as the Abbot of Unreason (*q.v.*).

Lord of the Isles. Title formerly borne by chieftains who ruled the Western Isles of Scotland. The earliest was Somerled, who expelled Norse invaders from parts of the Hebrides in the 12th cent. The title is one of those borne by a prince of Wales.

Lordosis. Increase in the anterior curvature of the lower part of the spine. It may be secondary to dislocation of the hip joint or disease of the hip joint, but is most often the result of sustained faulty posture. *See* Spinal Column.

Lord President of the Council. In the U.K., one of the great officers of state and usually a member of the cabinet. The council is the king's privy council, and it first had a regular president in the time of Charles I. Previously the lord chancellor or some other high official had presided. Since about 1680 the office of lord president has existed, and under the party system has been filled by a member of the party in power. The duties were considerable as long as the council looked after matters for which separate departments were afterwards created, e.g. public health, education, and agriculture; but then the lord president did little more than preside over meetings of the privy council (*q.v.*). Sometimes, however, the office is held in conjunction with a more laborious one, by the leader of the party in either house, or by a member of the commons who is virtually deputy prime minister.

Lord Privy Seal. In the U.K., a high officer of state, whose functions are now almost obsolete. Probably in Norman times the English kings had their privy seal as well as great seal, and for this also there was a keeper, who may have been employed by the kings as a check on the power of the chancellor. By the 16th cent. it was usual for state documents approved by the king to pass to the keeper of the privy seal, who sealed them and passed them to the chancellor, who took this as authority to affix the great seal. In 1884 legislation altered the practice, so the work came to an end. The office remains, its holder ranking as the fifth great officer of state. It is held by a politician of cabinet rank. *See* Chancellor.

Lord Provost. Chief municipal magistrate in the larger Scottish cities, Edinburgh, Glasgow, Aberdeen, etc. *See* Provost.

HOUSE OF LORDS AND ITS HISTORY

A. F. Pollard, M.A., formerly Prof. of History, London University

The information in this article is supplemented by those on Commons, House of; Parliament; Peerage; Privy Council. See also the biographies of notable peers, both past and present

The term the house of lords was first used in 1544 to describe those councillors, hereditary and other, whom the crown was accustomed to summon by special writ to parliament. Later it was applied to the chamber of the palace of Westminster in which they sat.

This house was thus originally the king's council in parliament, and its members sat in parliament solely in virtue of a special summons from the crown; that, indeed, is their title at the present day, although a series of decisions by the lords themselves has deprived the crown of its power to refuse the writ of summons to peers of the U.K. Peerage in this sense is, however, a comparatively modern conception. Edward I was ignorant of it, and the only persons who were necessarily present in his parliaments were the members of his council. They were always summoned by writ from the lord chancellor, who shared with the king the distinction of sitting in parliament without any summons.

Edward I, however, established the custom of also summoning to parliament, besides the representatives of shires, boroughs, and lower clergy, a number of great tenants-in-chief of the crown, such as the archbishops, earls, and bishops, and some barons and abbots selected by the crown. No one had a right to be summoned; it was a matter of obligation and duty, of suit and service at the king's court due from tenants-in-chief in return for the lands they held of the king; and the general tendency in the Middle Ages was to evade it. The number of abbots sank early in the 14th century to 27, and the number of barons from 100 to less than 50.

In time, however, a place in parliament came to be a seat of authority, and the service to be regarded as a privilege which was sought by some and denied to others. A peculiar and not very consistent theory of baronage and peerage was evolved, which restricted "peerage" or "equality" to a narrowing circle of increasingly powerful barons, and associated it with the tenure of land, and subsequently with the possession of certain dignities created by the crown. Possessors of these qualifications succeeded in denying to those councillors who did not

possess them a vote in the great council chamber in parliament. Even More, who, as chancellor, summoned every peer to parliament, and presided over their deliberations, was denied a vote. To avoid this anomaly it became the custom to create the chancellor a peer, although as late as Anne's reign there was still a chancellor who was not a peer. Other members of the council—judges, attorney- and solicitor-generals, serjeants-at-law—while they continued to be summoned by special writ to parliament, were reduced to the position of advisers. The term house of lords came into use in Henry VIII's reign in obvious imitation of the phrase house of commons, which was some two centuries older.

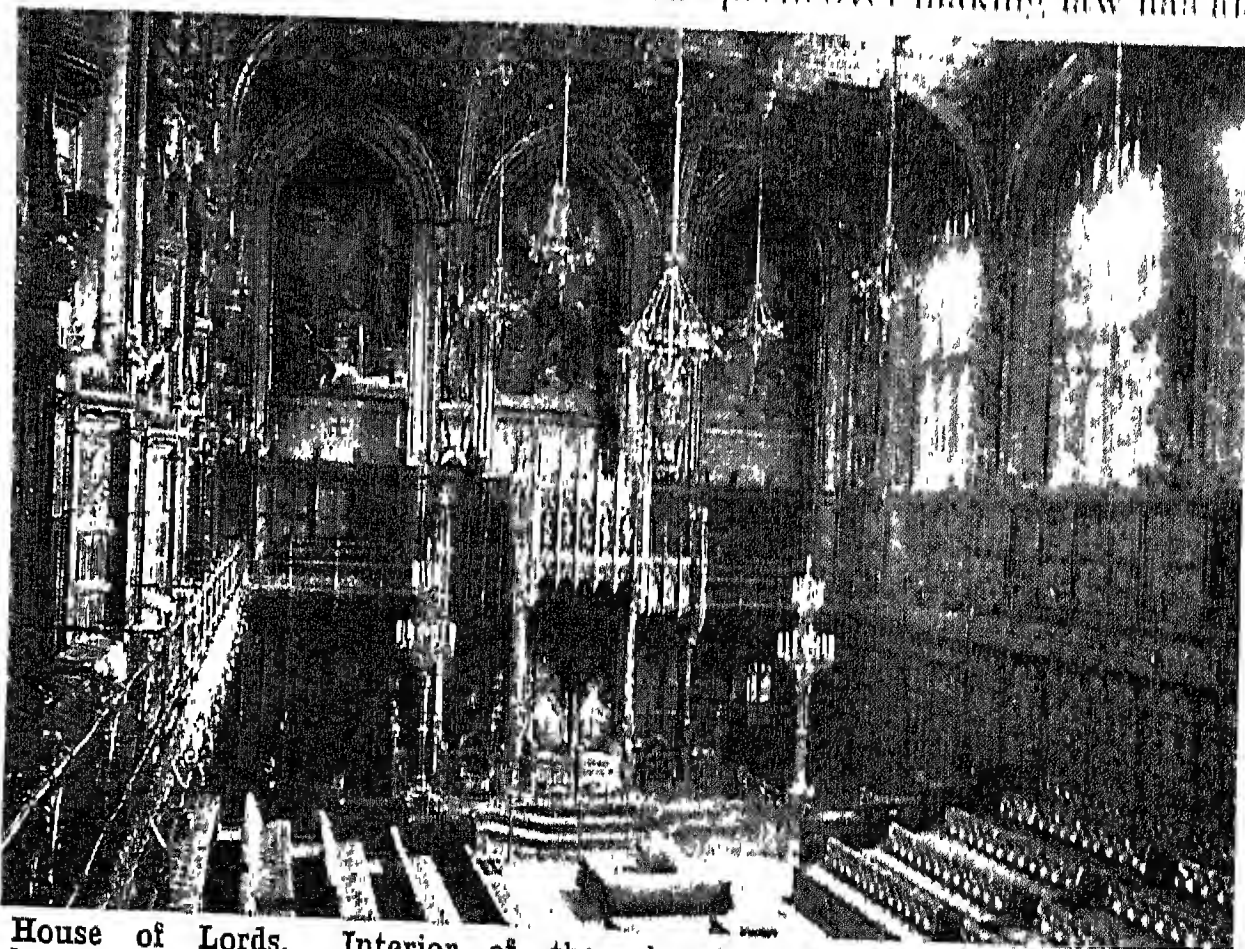
Increase in Numbers

With the dissolution of the monasteries the abbots disappeared, and in the reign of Charles I the crown was finally denied the right of either omitting to summon a peer who had once been summoned before, or of refusing to summon the successor to a "peerage." The only means left to the crown of influencing the composition of its council in parliament was the creation of peers, and an attempt to limit this prerogative by the Peerage Bill of 1719 was frustrated. There were 44 temporal peers in 1529, and about 60 at the end of Elizabeth's

reign. James I added about 51, and on the eve of the Scottish union in 1707 there were 178. Sixteen Scottish peers were then added, and 28 Irish by the union of 1800, but the younger Pitt nearly doubled the total number by creations.

In 1893 there were 567, and in 1918 over 800. The bishops, however, remained fixed at 26; four Irish bishops, added at the union, disappeared with the disestablishment of the Irish Church in 1869, and the English bishops, with the exception of the two archbishops and the bishops of London, Durham, and Winchester, have to wait their turn of seniority before receiving a writ of summons. The disestablishment of the Church in Wales did not make any difference in the number of bishops sitting. So, too, the elected Scottish peers remain 16 and the Irish 28. The power of creating peers in order to pass a particular measure was only once used, and then by the Tories in 1712, the mere threat being sufficient to secure the passing of the Reform Act of 1832 and the Parliament Act of 1911.

This vast increase in numbers was accompanied by a decline in authority and influence. The peers as such lost in the middle of the 19th century that supreme judicature which they inherited from the king's great council in parliament. When the so-called house of lords now sits as a supreme court of appeal, only those members who hold or have held high judicial office can participate in its proceedings. The control of the peers over making law has also



House of Lords. Interior of the chamber from the public gallery, looking towards the thrones. On the left are government benches; on the right, opposition; between them is the raised back of the woolstack. From 1941 the chamber was used by the House of Commons, pending the rebuilding of their own chamber, destroyed by German bombs

tended to follow their control over its interpretation. The Parliament Act of 1911 removed from their veto any bill deemed by the Speaker to be a money bill; any other bill rejected by them in three successive sessions could be presented for the royal assent without their consent two years from the time it first received a second reading in the house of commons. The Parliament Act of 1949 reduced this time of waiting to one year.

The *Lite Peerages Act*, 1958, empowered the sovereign to confer on any man or woman a peerage for life carrying the right to sit and vote in the house of lords.

Lords and Ladies. See Wake Robin.

Lord's Cricket Ground. Headquarters of the Marylebone Cricket Club. It is at the corner of St. John's Wood Road and Wellington Road, London, N.W.8. Its founder, Thomas Lord (1755-1832), a native of Thirsk, Yorks, was employed at the White Conduit Club c. 1780, and in 1787, at the instigation of the earl of Winchelsea and Lord Charles Lennox, he started a ground of his own on the site later made into Dorset Square. In 1811 he moved the turf to ground he had acquired in 1808 close to the Regent's Canal, whence in 1814 he transferred it to its present position.

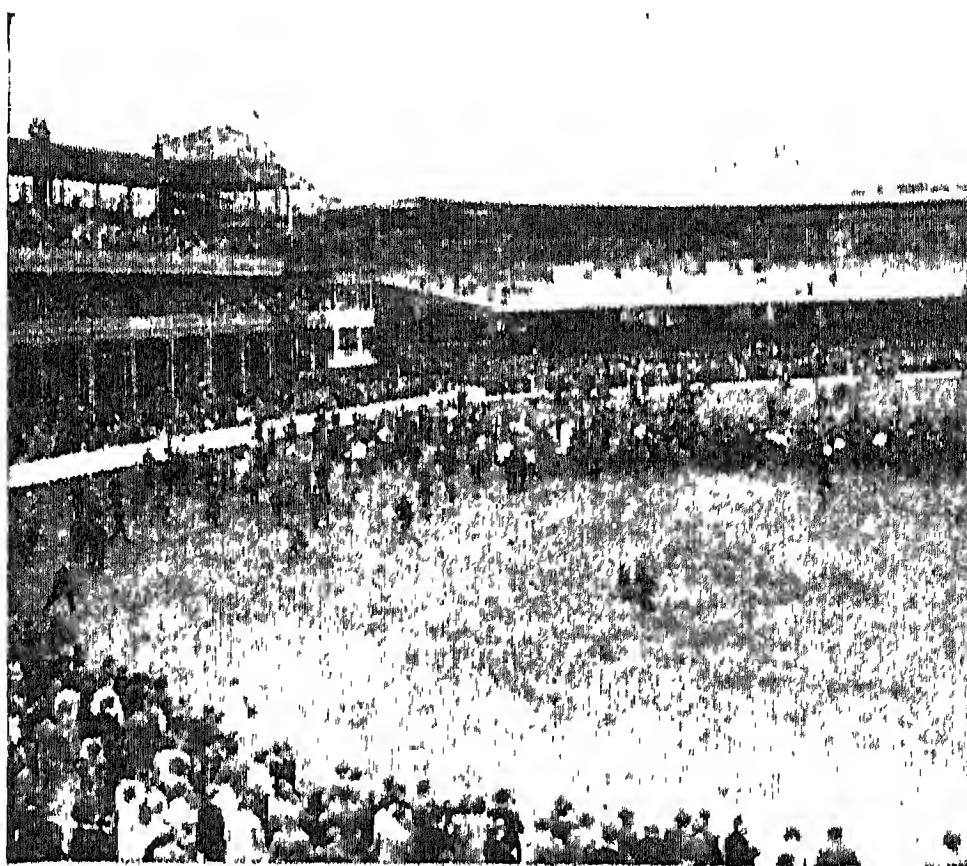
Besides the home matches of the Middlesex county club, the Oxford v. Cambridge and Eton v. Harrow fixtures, and one in each series of test matches against sides from the Commonwealth take place here. Consult Lord's, 1787-1945, Sir Pelham Warner, 1946.

Lord's Day Observance Society. British organization founded by Bishop Daniel Wilson 1831. It campaigns against all forms of Sunday entertainment. Its h.q. is at 55, Fleet Street, E.C.4

Lords of Session. See Session, Court of.

Lord's Prayer, THE. Prayer given by Christ to His disciples on the Mount (Matt. 6 *vv.* 9-13; Luke 11, *vv.* 2-4). Different versions are given by the two Evangelists and in the Book of Common Prayer. The Teaching of the Twelve Apostles, which is attributed to the 1st century A.D., directed that the prayer should be said three times a day by all Christians. Like the Creed, it was at first taught only to catechumens just before their baptism. As Christianity spread, it came to form a part of every service or fresh division of a service. The doxology (For Thine is the kingdom, etc.), a liturgical

addition, is Jewish in origin, but is found in The Teaching of the Twelve Apostles. S. Luke does not give it, and it is omitted from the R.V. text of S. Matthew. In the Book of Common Prayer, the Lord's Prayer, occurs twice in the daily offices, once in the Litany, and twice in the office for Holy Communion. The doxology was appended in 1661 for three of these: once in each of the daily offices



Lord's Cricket Ground, London. Part of the famous M.C.C. ground, also used by Middlesex, showing the pavilion. The playing area is 5½ acres

and once in Holy Communion. The doxology is not included in the Litany. See Paternoster.

Lord's Supper, THE. Term used in the English prayer book for the service whereat Holy Communion is received. It is also much used by Nonconformists for their equivalent service, in which the partaking of bread and wine is sometimes regarded as a simple memorial rather than a sacramental act. See Communion, Holy; Eucharist.

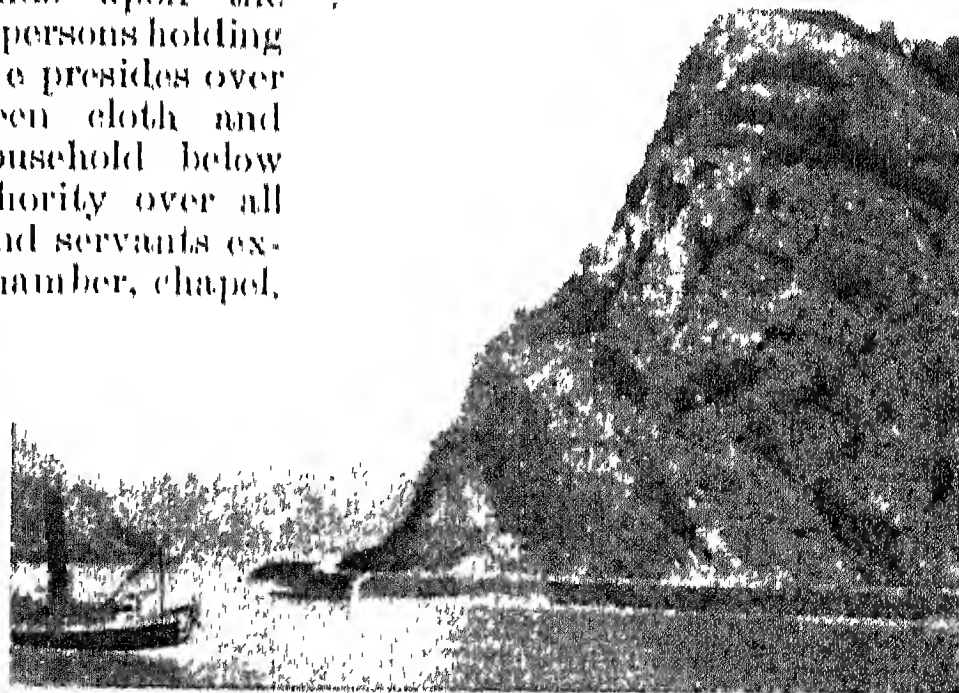
Lord Steward. Officer of the British royal household. His actual precedence in relation to the lord chamberlain depends upon the relative rank of the persons holding the two offices. He presides over the board of green cloth and directs all the household below stairs, having authority over all the royal officers and servants except those of the chamber, chapel, and stable. He is appointed by the sovereign, and is, by his office, a privy councillor. Many of his duties are actually carried out by a permanent official with the title master of the household.

Loreburn, ROBERT THRESHIDE REID, EARL (1846-1923). British lawyer and politician. Born April 3, 1846, in Corfu, he was educated at Cheltenham and Balliol College, Oxford. He was called to the bar in 1871, and became Q.C. in 1882, having two years previously been chosen Liberal M.P. for Hereford. In parliament he represented Dumfriesshire continuously from 1886 until 1905. Reid was

solicitor-general and attorney-general in 1894; in 1898 he represented his country in the dispute over the boundary of Venezuela; and in 1905, when the Liberals returned to power, was made lord chancellor and a peer. He secured the passing of the Court of Criminal Appeal Act, 1907. Made an earl in 1911, he retired next year, not in full sympathy with the Liberal programme. In 1917 he came forward as a

follower of Lansdowne's peace policy, and he wrote *How the War Came*, 1919. Loreburn died childless, Nov. 30, 1923.

Lorelei or **Lunel.** Rocky eminence on the right bank of the Rhine, near St. Goar, Germany. Over 400 ft. high, it stands in a narrow and formerly dangerous part of the river, and affords a remarkable echo. The legend that it is haunted by a siren who lures boatmen to their doom originated with a poem by Brentano, 1802. Later it was the subject of numerous songs and operas. Heino



Lorelei, Germany. The Lorelei Rock and bend of the Rhine, looking towards St. Goarshausen

and later poets and novelists have made the rock the theme of song and story. A railway tunnel runs through it.

Lorentz, HENDRIK ANTOON (1853-1928). A Dutch physicist. Born at Arnhem, July 18, 1853. he studied at Leyden, where he became professor of mathematical physics in 1878. Director of research at the Teyler institute at Haarlem from 1923, he continued to lecture at Leyden on physics. Awarded the Nobel prize for that science (with his pupil Zeeman) in 1902, he died Feb. 4, 1928.

Lorentz attempted to account for the fact that the speed of light appears the same for all observers, in whatever direction they may be moving (see *Ether*, p. 3155). Fitzgerald had suggested (1892) that all matter, including measuring rods, suffers a contraction in the direction of its motion. Lorentz worked out the amount of this contraction and of a similar change in time intervals. The Lorentz transformations (1903) connecting coordinates (x, y, z, t) and (x', y', z', t') in relative motion with velocity v along the x -axis are:

$$x' = \frac{x - vt}{\sqrt{1 - v^2/c^2}}, \quad y' = y, \\ z' = z, \quad t' = \frac{t - (v/c^2)x}{\sqrt{1 - v^2/c^2}}$$

where c is the speed of light. These formulae later found their place in Einstein's special theory of relativity (*q.v.*).

Lorenz, ADOLF (1854-1946). Austrian surgeon. Born in Silesia, he graduated at Vienna university in 1880, and became professor of surgery there, specialising in orthopaedy. His treatise on Dislocation of the Hip, 1895, created considerable discussion, and his "bloodless" method of reducing congenital dislocation of that joint was new to surgery. By this method, which consists of manipulation of the muscles and, if necessary, the breaking of bones, there is no outward wound and no haemorrhage.

Loreto. North-easternmost and much the largest department of Peru. It is bounded E. by Brazil and N. by Ecuador and Colombia, which have conflicting claims to those parts of the territory which lie N. of the Marañon. Mainly in the Amazon valley, it is traversed by the Marañon and the Ucayali. Largely covered with forests, it yields rubber, cinchona, gold, tobacco, and salt. The climate is exceedingly hot and unhealthy for Europeans. Below the capital, Iquitos (*q.v.*), the Amazon vir-



Lorient, Brittany. Place Bisson, with the church of S. Louis, built 1709, on the left

tually begins. Area, 119,270 sq. m. Most of its inhabitants are Indian. Pop. (est. 1956) 423,250.

Loreto. A city of Italy, in the prov. of Ancona. Situated on the slopes of a hill, 3 m. from the Adriatic, and 15 m. by rly. S. of Ancona, it is one of the leading places of pilgrimage for Roman Catholics, who are attracted to the Santa Casa or Holy House, in which it is said the Virgin Mary lived when at Nazareth. According to legend it was carried by angels from Galilee to Dalmatia, and from there to its present site. The Santa Casa is a small, stone building, encased by a marble screen designed by Bramante. A handsome Renaissance church with a rich dome was built over it, 1465-1587. A fire on Feb. 22, 1921, destroyed the ebony image of Our Lady; a German air raid, July 5, 1944, damaged the church. Pop. (1951) 8,787.

Loretto School. Scottish public school, situated about 6 m. E. of Edinburgh. It owes its character to H. H. Almond, headmaster 1862-1903, who held advanced ideas on education, stressing the importance of attention to physical development as a prerequisite of mental alertness. Loretto boys still wear shorts and open flannel shirts and spend much time in the open air, whatever the weather. Numbers are strictly limited to 200 in the upper school and 53 in the junior. There are four sides: classical, modern, mathematical, and scientific. In 1946 the school's administration was transferred from a company to a board of trustees. Consult *Loretto School Past and Present*, H. B. Tristram, 1911.

Lorian Swamp. An extensive marshy tract in Jubaland, Kenya Colony, just N. of the equator.

Lorient. Town and seaport of France, in the dept. of Morbihan, Brittany. It stands near the junction of the Scorff and

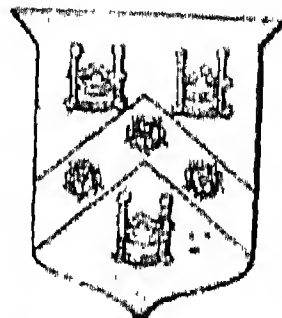
the Blavet 30 m. W.N.W. of Vannes. One of the chief naval stations in the country, it has state docks, ship building yards, magazines, barracks, etc. Gun and naval armour are made. There is also a commercial harbour. Lorient has a trade in coal etc., and is a fish-

ing centre for oysters and sardines. The church of S. Louis was built in the 18th cent. Pop. 11,838.

Lorient dates from about 1630, when some warehouses were built here. It flourished for many years as a station of the French East India Co., whence its name of l'Orient. On the dissolution of the company about 1770, the dock yards were taken over by the government, and developments of the 18th century made it into a first-class naval base. During the Second Great War the Germans converted this into a submarine base, and the town suffered heavily from Allied bombing. When the Germans withdrew E. in 1944, Lorient was one of the towns in which they left a garrison to prevent its use by the Allies, who contained but did not attack it. The garrison did not surrender until May 9, 1945.

Lorimer, Sir ROBERT STODART (1864-1929). Scottish architect, born Nov. 4, 1864. He experimented in domestic architecture, and won international fame as architect of the Scottish national war memorial chapel on the Castle Rock, Edinburgh, and of the new chapel for the Knights of the Thistle in St. Giles's cathedral. Knighted in 1911, he died Sept. 13, 1929. Consult a study by C. Hussey, 1931.

Loriners' Company. London city livery company. Originally a guild of bridle (Lat. *lorum*, thong, bridle rein), bit,



Loriners' Company arms

and spur makers, it had existed as a fellowship for about 500 years when it received its charter, 1711. It had a small hall in London Wall, demolished c. 1765. The clerk's offices are at 31-33, High Holborn, W.C.1. The spelling, lorimer, survives in a family name.

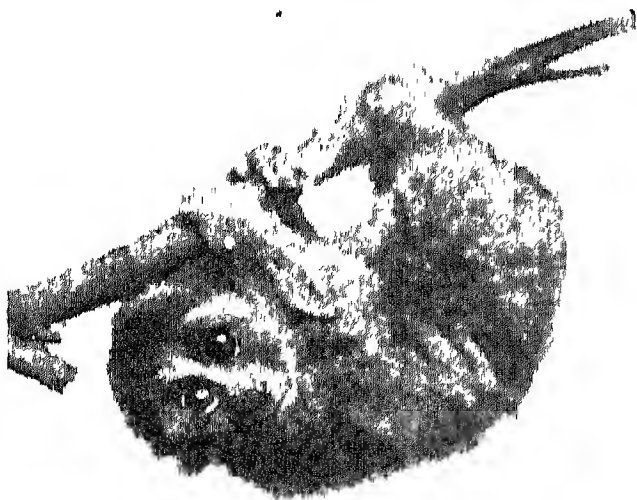
Loriquet. A popular name for certain genera of small parrots. Allied to the lorises, they are found in the E. Indies and Australasia, except New Zealand. One of the largest is Swainson's loriquet, which is 6½ ins. long in body, with a tail of almost the same length. Its general colour is green, with a purple head and blue under-parts,



Loriquet. Scaly-breasted variety, *Trichoglossus chlorolepidotus*

the under-wing coverts being red. It has a red beak with a yellow tip, lives mainly on honey, and generally congregates in large flocks in the forests.

Loris. Name applied to a group of lemurs found in tropical Asia. They are small and have usually little or no tail, while the index finger of the hand is extremely small and feeble. They are noc-



Loris. Small animal of lethargic habit found in tropical Asia, also called the slow lemur

turnal in habit and move with such slowness and stealth as to be called the slow lemurs. They vary in size from 8 ins. to about the size of a cat, are stoutly built, and have very broad heads. The eyes are round and conspicuous, rather suggesting those of an owl. The loris eats leaves, fruit, insects, eggs, and small birds. One species, the slender loris, is remarkable for its extremely slim limbs. They are of the family Nycticebidae.

Loris-Melikov, MICHAEL TARIELOVICH, COUNT (1826-88). A Russian soldier and statesman. Born at Tiflis (Tbilisi), he first saw service in the Caucasus, distinguished himself in the Crimean War, and took Kars in the Turkish War of 1877. A liberal in politics, he held various civil posts, being minister of the interior

to Tsar Alexander II. His administration was characterised by humanity and sincere efforts towards bringing about social reform. He died at Nice, Dec. 22, 1888.



Count Loris-Melikov, Russian soldier

Lormont. Town of France, in the dept. of Gironde. It lies on the Garonne, near Bordeaux, in beautiful country, and has ship-building yards. When the kings of England were dukes of Aquitaine, they had a country house here in which Richard II (Richard of Bordeaux) was born. Pop. (1954) 5,195.

Lorna Doone. Romance of Exmoor by R. D. Blackmore (*q.v.*), first published in 1869. The scene is laid in Somerset and Devon in the 17th century, and deals with the feud between John Ridd (supposed narrator of the story), a farmer of Oare, and the Doones, a band of outlaws who made their home in a fastness on Exmoor and lived by plunder and blackmail. The feud is terminated by the extinction of the outlaws and the marriage of John Ridd to Lorna Doone, a high-born, motherless maid who had been brought up amongst them. The story is built upon a substratum of fact, both John Ridd, a farmer famous for his immense physical strength, and a family of wild Doones having lived in the neighbourhood of Exmoor. Set against an historical background of the time of James II, touched in with great dexterity and fidelity to fact, the novel ranks among the best romances produced in the 19th century, distinguished by simplicity, vigour, purity of sentiment, racy humour, and much admirable word painting of nature.

Lorne. District of Argyllshire, Scotland, which lies between Loch Awe and the coast. The marquess of Lorne is one of the titles of the duke of Argyll, being borne as a courtesy title by an eldest son. It was long held by the nobleman who married the Princess Louise, fourth daughter of Queen Victoria, and became the 9th duke in 1900. (*See* Argyll, Duke of.) The Firth of Lorne is a strait separating the district of Lorne on the mainland from the island of Mull. There is a sympathetic description of the district in John Splendid, by Neil Munro.

Lorne, MARION (b. 1888). An American actress. Born in Penn-

sylvania, Aug. 12, 1888, she was educated there before making her stage début in New York, 1905. On the London stage from 1915, she became known for her portrayals of fluffily minded women in a series of comedies written by her husband, Walter Hackett (*q.v.*) and others; they included *Ambrose Applejohn's Adventure*, 1921; *Other Men's Wives*, 1928; 77, Park Lane, 1928; *Road House*, 1932; *Hyde Park Corner*, 1935.

Lörrach. Town of Baden-Württemberg, W. Germany, above the river Wiese, 5 m. N.E. of Basel. It manufactures textile goods, chocolate, and furniture, and has a trade in wine and fruit. It became a market town in the Middle Ages. Near is the castle of Rotteln, once a residence of the rulers of Baden.

Lorrain, CLAUDE. Name taken by the French painter Claude Gellée (*q.v.*), who was born in Lorraine.

Lorrain, JEAN. Pen-name of Paul Duval (1855-1906), a prolific French writer. Born at Fécamp, Aug. 9, 1855, the son of a ship-owner, he was educated in Paris. Under the name Raitif de la Bretonne, he contributed to the *Courier français*, the *Écho de Paris*, the *Journal*, and other papers. His work was remarkable for the brilliance with which he presented drunkenness and poverty; he was capable also of directness and simplicity. His publications included vols. of verse, *Le Sang des dieux*, 1882; *Modernités*, 1885; *L'Ombre ardente*, 1897; essays, e.g. *La Forêt bleue*, 1883; *Poussières de Paris*, 1899; *L'École de vieilles femmes*, 1905; and plays, *Très Russe*, 1893 (with Méténier); *Yanthis*, 1894; *Une nuit de Grenelle*, 1903. Faure composed music for his lyric tragedy *Prométhée*, 1900. He died in Paris, July 1, 1906.

Lorraine (Ger. Lothringen), Dist. of France. It lies S. of Luxemburg and W. of Alsace and includes the departments of Meuse, Meurthe-et-Moselle, Moselle, and Vosges. The duchy of Lorraine was much larger; it included Nancy and the country thereabouts. (*See* map in page 321.)

Lorraine dates from 843, when, by the treaty of Verdun, three grandsons of Charlemagne divided his empire between them. One part, a strip between France and Germany including modern Alsace and Lorraine, was given to Lothair, from whom it takes its name, through the Latin Lotharingia. After the fall of the Frankish empire, Lorraine was a

bone of contention between France and Germany, and, roughly speaking, that has been its history ever since. Early in the 10th century it became a French possession, but in a few years it was handed over to Germany, and German it remained until 1542.

At first there were two Lorraines, Upper and Lower, but from about 1190 Lower Lorraine came to be called Brabant, and the name Lorraine was confined to Upper Lorraine, the country of the Moselle. This Lorraine was ruled by a line of dukes nominally vassals of the German kings, but so powerful that one of them was strong enough to defy the famous emperor Frederick II, and in 1542, when France and Germany were at war, Duke Anthony managed to make Lorraine independent.

Its independence did not last very long, for French influence was making itself felt in the land. Duke Charles the Great, who reigned 1545-1608, had been educated in France and was a son-in-law of King Henry II, and he assimilated French customs, which he transmitted to later dukes, and through them to the majority of their subjects. Cardinal Richelieu sent French officials to assist in governing the country; to this the duke objected, but without effect, and in the end he became a vassal of the French king. In 1736 the French secured the duchy for Stanislaus, the exiled king of Poland, father-in-law of Louis XV.

In 1766, when Stanislaus died, Lorraine became part of France and remained so until 1871. In that year it was seized by Germany and by the treaty of peace was reduced in size. Nancy, hitherto the capital, was kept by France, but most of Lorraine was transferred to the conqueror and with Alsace became the German imperial province of Elsass-Lothringen, called in French and English Alsace-Lorraine (*q.v.*).

The blood of the old dukes of Lorraine runs in the veins of the British royal family: Claude, a younger son of Duke René II, was the ancestor of the Guises, one of whom was Mary of Lorraine, queen of James V of Scotland and mother of Mary, Queen of Scots, from whom the house of Windsor directly descends. Francis of Lorraine (afterwards the emperor Francis I) married Maria Theresa, and from them were descended the Hapsburg-Lorraine emperors of Austria.

Lorraine, CHARLES LEOPOLD NICHOLAS SIXTUS, DUKE OF (1643-90). Soldier of the Empire. He

was born at Vienna, April 3, 1643, son of Prince Nicholas Francis, a cardinal. In 1670 Louis XIV of France seized Lorraine and expelled the reigning duke, on whose death

in 1675 Charles Leopold, his nephew, assumed the title: he was never recognized by France, and never gained possession of his duchy. An unsuccessful candidate for the Polish throne in 1668 and 1674, he was made a field marshal in 1675 by the emperor Leopold I, and in 1676 led the imperial army which took Philipsburg. He distinguished himself in helping to save Vienna from the Turks in 1683, and in 1687 gained the great victory of Mohács over them. In command in 1689 in the war against France, he died at Wels, near Linz, April 18, 1690.

Lorraine, PRINCE CHARLES ALEXANDER OF (1712-80). Soldier of the Empire. Born at Lunéville,



Prince Charles of Lorraine, soldier of the Empire

Dec. 12, 1712, a son of Leopold, duke of Lorraine, he was brother of Francis, duke of Lorraine (afterwards the emperor Francis I), and married a sister of Maria Theresa, Francis's wife. In the War of the Austrian Succession, he was defeated by Frederick II in the battle of Chotusitz in 1742; the next year he repeatedly defeated the Bavarians, occupied their country, and entered Alsace; he also drove the Prussians from Bohemia. Advancing into Silesia, he was routed by Frederick at Hohenfriedberg in 1745, and by Saxe at Raucoux in 1746. In the Seven Years' War Prince Charles was utterly defeated by Frederick at Leuthen (*q.v.*), 1757. He then returned to the Austrian Netherlands, which he governed wisely until his death at Tervueren, near Brussels, July 4, 1780.

Lorraine, Cross of. Emblem first suggested by Admiral Emile Muselier, and adopted by Gen. de Gaulle for the French land, sea, and air forces he organized in 1940, after the German defeat of France, for service with the Allies in the Second Great War. The cross of



Charles, Duke of Lorraine, soldier of the Empire

Lorraine had been borne by Joan of Arc, and first appeared in French heraldry on the arms of the dukes of Lorraine, in memory of their ancestor, Godfrey de Bouillon, who brought it back from the Holy land. The double branched cross was used on the tomb of early Christians as a disguised cross to prevent desecration of their graves. In heraldry the cross is called Benedictine. See Free France illus.

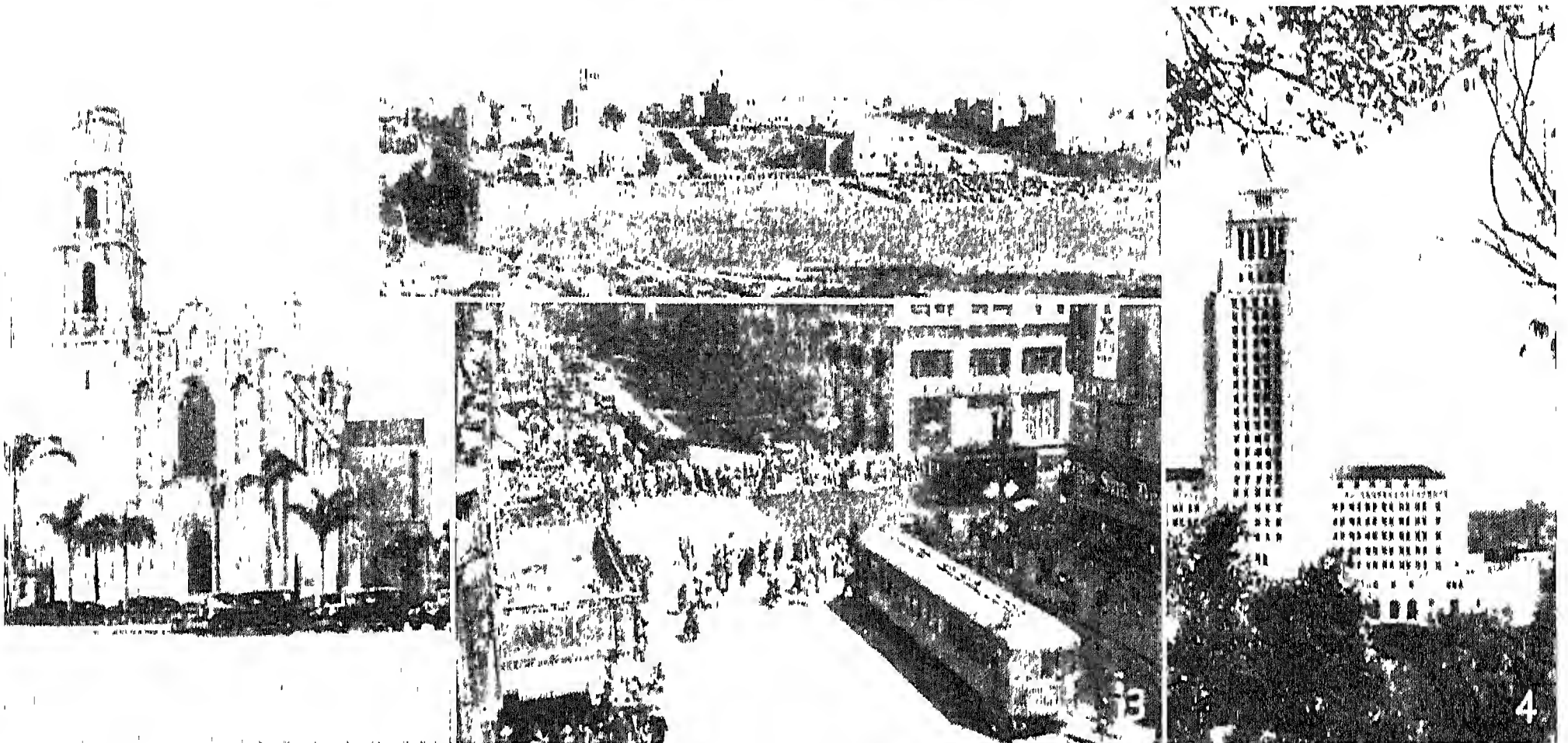
Lortzing, (GUSTAV) ALBERT (1801-1851). German composer and singer, born at Berlin, Oct. 23, 1801. His first opera *Ali Pacha von Janina* was performed in 1821 at Cologne. Leading tenor from 1833 at the theatre of Leipzig, where he did his best work, he gained great success with *eg. Zar und Zimmermann*, 1837; *Hans Sachs*, 1840; *Der Wilschütz*, 1842. He was conductor at Leipzig theatre 1844-45, at Vienna 1847-48, and at the Friedrich Wilhelmstrasse theatre in Berlin, 1849, and died in Berlin, Jan. 21, 1851. He had a great capacity for writing fresh, animated music imbued with feeling for the action of the opera.

Lorvão. Town of Portugal, near Coimbra, in the province of Beira Litoral. It is noted for a convent founded in the 6th century and dedicated to our Lady of Expectation in which stands a silver coffin containing the remains of the princesses Teresa and Sancha who were beatified by Pope Clement XI. The church of the convent has a beautiful high altar, and valuable paintings.

Lory. A family of beautifully coloured parrots, found only in Australasia. There are about ten species. The beak is less curved than in many parrots, and the long tongue is provided with a brush with which it gathers the nectar that forms an important part of the food of these birds. They also eat fruit, and usually congregate in small flocks. Lories readily learn to talk, and for this reason are in demand as pets. *Loriquet (q.v.)* is a popular name for certain genera of the family.

Los (Span. *Islas de los Idolos*). Group of islands belonging to France, lying off the coast of French Guinea. British from 1818 until ceded to France in 1904, they are of great strategic value, as they lie immediately W. of the port of Konakry. They produce ground nuts and bauxite.

Los Alamos. Locality in the desert of New Mexico, U.S.A., 25 m. N.W. of Santa Fé. Here was one of the three principal



Los Angeles, California. 1. Roman Catholic cathedral of S. Vibiana. 2. University of California at Los Angeles, which occupies a site of 375 acres on the western outskirts. 3. Busy junction of main streets. 4. City Hall, the tower of which rises to a height of 464 ft.; at the top is a beacon for the guidance of air pilots

divisions of the atomic bomb project of the Second Great War. At this vast research and development laboratory, by the summer of 1945 many eminent scientists and their families had lived for two and a half years. This community had no post office and its mere existence was a closely-guarded secret. Extending over 70 sq. m., the project included 37 laboratories and plants, 201 other technical structures, and 302 apartment buildings. The pop. reached 6,000. *See Atomic Bomb.*

Los Andes. Former territory of Argentina. In 1913 it was divided between the provinces of Catamarca, Jujuy, and Salta.

Los Andes. Formerly a state of W. Venezuela. Named from the branches of the Andes running through it, it is now divided into the states of Táchira, Mérida, and Trujillo (*q.v.*).

Los Andes OR SANTA ROSA DE LOS ANDES. Town of Chile, in the prov. of Aconcagua. It stands on the Juncal on the W. slopes of the Andes, 18 m. by the trans-Andean rly. E.S.E. of San Felipe, and gives its name to an administrative district. Cattle raising and mining are carried on.

Los Angeles. City of California, U.S.A., co. seat of Los Angeles co., California's largest city, it is fifth largest municipality in pop. and, with its 451 sq. m., largest in area in the U.S.A. Since 1900, the pop. has doubled or more than doubled in every decade except 1930-40. The principal factors in this fabulous growth are the Calif. sunshine, climate, and soil productivity; the discovery of

oil; the development of a great man-made port which ranked third among U.S. ports in total tonnage in 1944; the enterprise and ingenuity that brought water and electric power hundreds of miles across desert and mountain; and the concentration of the U.S. motion-picture industry in several Los Angeles suburbs, the best-known being Hollywood (*q.v.*). The city sprawls across the 4,155 sq. m. of the co., having annexed some of the neighbouring communities. Among its best-known neighbours and appendages are Long Beach, Beverly Hills, Santa Monica, Venice, Glendale, Pasadena, and Inglewood.

Los Angeles stands on the Los Angeles R.; with its suburbs it stretches from the San Gabriel Mt. foothills across the coastal plain to San Pedro and Santa Monica bays on the Pacific; it includes a large part of the San Fernando Valley. The artificial harbour, constructed with federal govt. and city funds, embraces the ports of San Pedro and Wilmington and is connected with the channel of Long Beach harbour; it has a 40-m. waterfront. Los Angeles is the home-base of the U.S. Pacific fleet and is the nearest U.S. Pacific port to the Panama canal. Steam and motor ships connect it with Hawaii and many Pacific ports, while it is served by several rlys. and a municipal airport a mile square. Street rlys., including 1,000 m. of interurban electric lines, and motor buses serve Los Angeles and its satellites; private motor car traffic is exceedingly heavy.

Los Angeles architecture is a hodge-podge of styles and periods; but the civic centre, with its tall white gleaming edifices, is impressive. Buildings of special note are the 464 ft. city hall with a skyscraper tower, the 18-storey U.S. post office and court house, the county hall of justice, the hall of records, the Shrine auditorium, the Union passenger terminal, which is T-shaped and consists of thirty low, white stucco, red-tile-roofed units in mission architecture, the R.C. cathedral of S. Vibiana with a 135-ft. clock tower, seat of the Southern Calif. archdiocese, the county museum of history, science, and art, and the Angelus temple, a domed auditorium seating 5,300 in which Aimee Semple McPherson (*q.v.*) staged her meetings. Among educational institutions are the university of Southern California, the university of California at Los Angeles (the state university's southern division), Occidental college, the R.C. Loyola university of the South, and the California institute of technology at Pasadena. Churches exceed 600.

Los Angeles co. is first among U.S. counties in the value of products obtained from the soil. The country's first cooperative farm marketing project was organized here. Products include citrus and other fruits, almonds, walnuts, lettuce, celery, sugar beet, barley, alfalfa, tomatoes, flowers, and seeds.

In 1913 an aqueduct bringing water to the valley and the city through the Mohave desert from the Sierra Nevada mts. 233 m.

away was completed. A newer aqueduct, bringing water from the Colorado r. to irrigate 250,000 acres and supply water to Los Angeles and twelve other cities, penetrates six mountain ranges and includes 38 tunnels. Electric power is brought over 266 m. of transmission lines from Boulder dam. Petroleum and its by-products constitute 85 p.c. of the port's exports. Los Angeles imports raw silk, sugar, copra, coffee, vegetable oils, whisky and other spirits, newsprint, and crude rubber. It has petroleum refineries; makes aircraft and accessories, women's clothing, chemicals and drugs, paint, glass, foundry and machine-shop products, furniture, film for the film industry, structural and ornamental ironwork, and rubber products; tins fruits, fish, meat, and other foods. Natural gas is abundant. Within 300 m. of the city are deposits of copper, salt, potash, graphite, limestone, marble, and onyx.

Los Angeles has a distinctive appearance, with its broad streets lined by palm trees, front lawns blanketed in golden California poppies and other flamboyant and semi-tropical flowers, and the low, white or pastel-coloured houses showing, for the most part, a Spanish influence. Los Angeles is noted for the number and variety of the religious, political, and other cults which flourish there, and for the informal, colourful attire of its inhabitants.

The diversified inhabitants of Los Angeles include Mexicans, Negroes, Chinese, Japanese, and Filipinos; white inhabitants include aspirants to cinema fame, aircraft-factory and oilfield workers, retired farmers and their wives from the Middle West. The development here during the Second Great War of aircraft plants and shipyards brought thousands of workers from the Middle West and the South—the population of the city rose by half-a-million between censuses of 1940 and 1950; and most of these "temporary" citizens proved to be permanent settlers.

Founded in 1779, Los Angeles was at various times the capital of the Mexican province of California. It was captured by a U.S. naval force in 1847. Its city charter dates from 1850. The name is an abbreviation of the Spanish *El Pueblo de Nuestra Señora La Reina de los Angeles de Porciuncula*. The Village of Our Lady Queen of the Angels of Porciuncula. In 1900 the popu-

lation of Los Angeles city was 102,489; in 1950 it was 1,957,692, of whom 247,054 were foreign born (39,742 Mexican, 34,109 Russian, 27,969 Canadian); the pop. of the met. dist. was 4,339,225; of Los Angeles co. 4,151,687. The local pronunciation of the name is *loss an-jä-less*.

Los Angeles. Capital of the Chilean prov. of Bio-Bio. In a valley 20 m. N. of the river Bio-Bio, it is on a branch of the main rly. which runs S. from Concepcion. Settled in 1739, it is in a district producing wine, fruit, and timber. Pop. (1955 est.) 85,000.

Losch, OTTILIE ETHEL (b. 1902). An Austrian-born British dancer, professional name Tilly Losch. A Viennese, she appeared at the opera house when a child, and later became première danseuse under the direction of Reinhardt, making her American début in his production of *A Midsummer Night's Dream*, 1927. Engaged by C. B. Cochran, she achieved outstanding success at the London Pavilion in *This Year of Grace*, 1928, and *Wake Up and Dream*, 1929. She was the Nun in a revival of *The Miracle at the Lyceum* in 1932, and formed her own ballet company next year. During her marriage to the 6th earl of Carnarvon, 1939-47, she retired from the stage.

Losinj. See Lussino.

Los Rios (Span., the rivers). Inland province of Ecuador. It is situated on the W. slope of the Andes between the provs. of Bolivar on the E. and Guayas on the W. The mountainous surface is well watered by the Guayaquil and many other rivers. The chief occupations are agriculture and stock raising. The capital is Babahoyo, a busy, thriving town. Area, 2,295 sq. m. Pop. (1955 est.) 175,400.

Lossie. River of Morayshire, Scotland. It rises on Carn Kitty and follows a winding N.E. course past Elgin to the Moray Firth at Lossiemouth. It is 30 m. long.

Lossiemouth AND BRANDERBURGH. Police burgh, seaport, and resort of Morayshire, Scotland. It stands at the mouth of the Lossie, 5 m. N. of Elgin. The harbour handles the third largest volume of white fish in Scotland. Its position on the Moray Firth attracts visitors, for whom there are good beaches and golf links. The burgh was formed in the 19th century from three villages, Lossiemouth, Branderburgh, and Stotfield. Here Ramsay MacDonald was born and buried. The ruined Kinneddar Castle and Spynie Palace are in the vicinity. Pop. (1951) 4,947.

Lost Horizon. Novel by James Hilton. Published in 1934, it was notable for its imaginative treatment of the adventures of an Englishman in a Tibetan monastery, Shangri-la (symbolising spiritual awareness). It was awarded the Hawthornden prize, was made into a film, with Ronald Colman, in 1937; and was several times broadcast in sound radio, with Eamonn Percy.

Lost Property. In English law finding is not keeping. A lost article remains the property of the losing owner; and he can sue the finder, or anyone else who has it in his possession, for its recovery; or, if he pleases, for damages for "conversion." A finder who converts property found to his own use may be charged with larceny. If a bill of exchange, promissory note, or cheque should be lost, the true holder can still sue on it, and the judge may order that the loss shall not be set up as a defence, provided the holder (finder) given an indemnity to the person sued on the instrument. If a document has been lost, secondary evidence of its contents may be given.

In London there are several lost property offices, the chief being those of the Metropolitan Police, at 109, Lambeth Road, S.E.1; of London Transport, at 200-202, Baker Street, W.1; and of British Railways.

Lost Ten Tribes, THE. Term for the N. branch of the Hebrew people, which disappeared about 140 years before the dispersion of the Jews. In 721 B.C. the Assyrians destroyed the kingdom of Israel and removed many of the inhabitants to Media and other outlying parts of their empire, where they disappear from history. This disappearance has in modern times been a matter of anxiety to many Jews and Christians, especially to those who feel that in a restored Jewish land the ten tribes ought to be represented, as well as those of Judah and Benjamin, to which most present-day Jews belong. Consequently attempts have been made to prove the existence of the lost tribes in one part of the world or another.

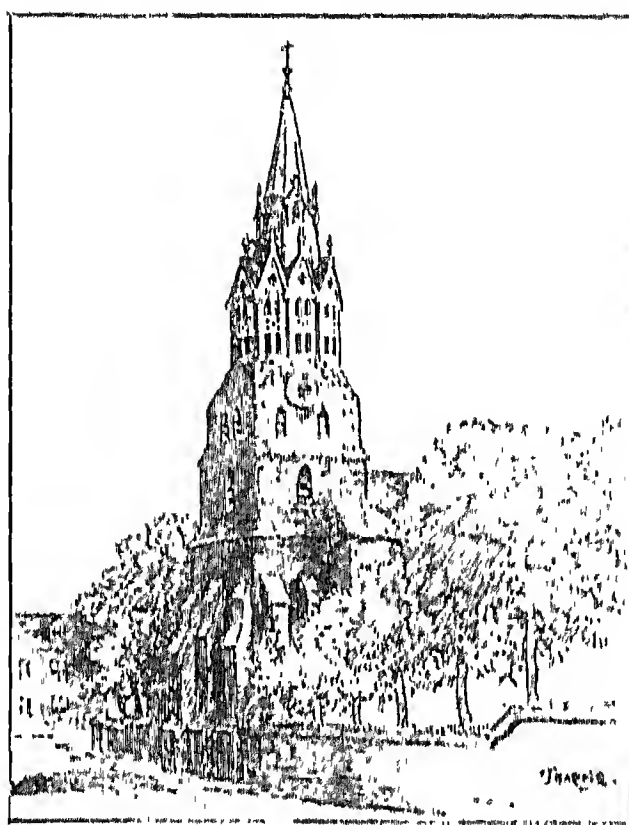
About 1644 Antonio de Montezinos (Aaron Levi) announced that some Israelite tribes existed in America, and it was supposed that they had spread there from Tartary and China. In 1649 John Sadler suggested in his *Rights of the Kingdom* that the English were of Israelitish origin. The suggestion was developed by Richard Brothers (1757-1821) in many

volumes, and was adopted by John Wilson (1840), Edward Hine (1871), and a number of subsequent writers. The Anglo-Israelite doctrine has many adherents in English-speaking countries, though not countenanced by any scholars of repute. See British Israel World Federation.

Lostwithiel. Mun. borough and market town of Cornwall, England. It stands on the Fowey, 23 m. N.E. of Truro, with which there is rly. connexion. The chief buildings are the church of S. Bartholomew and the duchy hall, a 14th century building. The 14th century bridge, the nearest bridge to the sea, gave the town its strategic importance. In the Middle Ages markets and fairs were held at Lostwithiel, and it became important under the earls of Cornwall. The stannary courts were held there, and there are slight remains of the stannary prison. It was given the right to coin tin, and some of the county business was carried on here. From 1305 to 1832 it sent two members to parliament, and it was made a corporate town by James I. In Sept., 1644, the parliamentary forces under the earl of Essex surrendered to the royalists at Lostwithiel, except only Essex and the horsemen who escaped. Near are Lanhydrock House and Restormel Castle. Pop. (1951) 2,163.

Lot OR SORT. Object chosen or cast to determine a question. The question may be determined by its number, inscription, etc., or the way in which it falls when cast or thrown. Casting or drawing lots was an ancient method of divination. It was employed by the Israelites as a means of ascertaining the divine will in times of crisis or perplexity (Prov. 16, v. 33). The mysterious Urim and Thummim (Ex. 28; 1 Sam. 28) are believed to have been engraved images or jewels carried in a pouch under the breastplate (*q.v.*) of the priest, and used in this connexion. The lots seem to have been usually tablets of wood or stone suitably inscribed. They were used to detect a culprit (Josh. 7; 1 Sam. 14; Jonah 1); to choose an office-bearer (1 Sam. 10; 1 Chron. 24; Acts 1); in the selection of the sin-offering and the scapegoat (Lev. 16); and for the division of the land of Canaan (Num. 26). The practice was continued in the early Church, and is referred to by S. Augustine; by the Puritans, who were ridiculed by Swift on account of it; by the Bohemians in selecting bishops; and by the Moravians.

Practised to some extent in ancient Greece, drawing of lots was much more common among the Italians, being specially referred to by Cicero, Suetonius, Livy, and other writers. Distinction is made between the *sortes* (lots) in temples and those drawn commonly. The *sortes* were tablets of wood, bronze, or other material, inscribed with a verse or proverb. By Cicero's time this form of divination had become virtually obsolete, except at Praenestē, but the word *sortes* survived as a term for any kind of oracular deliverance. Virgil applied it to the Sibylline Books (*q.v.*). The opening at random of Homer or Virgil, the Bible or the Koran, and regarding the



Lostwithiel, Cornwall. Parish church of S. Bartholomew

From a drawing by G. G. Harper

first line upon which the eye falls as prophetic is a form of drawing lots. See Divination; Lottery; Situla; Sortes; Urim and Thummim.

Lot. River of France. It rises in the Cévennes, on the Mont du Goulet, Lozère dept., and flows across the Central Plateau to join the Garonne at Aiguillon, Lot-et-Garonne. Its length is about 300 m., and its course mainly westward. Its chief tributaries are the Truyère and the Celé. The lower half of its course has been canalised. Like the Tarn, the Lot has carved the plateau limestones into a series of bluffs, or causses, with numerous caves where surface water disappears into sinkholes.

Lot. Department of France. In the S.W. of the country, it has an area of 2,017 sq. m. Much of it is hilly, and the chief river is the Lot. Others are tributaries of the Tarn and the Dordogne. The vine is extensively grown; horses, sheep, and cattle, poultry, and bees are reared; iron, coal, zinc, and limestone are worked. Wheat,

maize, and oats are also cultivated, as are potatoes, tobacco, and fruits. Cahors is the capital; other towns are Figeac, Gourdon, and Souillac. Pop. (1951) 147,754.

Lot. Son of Haran and nephew of Abraham (Gen. 13). He accompanied Abraham from Mesopotamia to Canaan, but as a result of strife among the herdsmen he parted from his uncle and was assigned the Jordan valley as his country, making his home at Sodom, whence he was taken captive by Chedorlaomer, but was rescued by Abraham. He was visited by mysterious messengers at Sodom, who rescued him and his family from the destruction of the city by fire. The story of Lot's wife has been connected with the fantastically shaped masses of rock-salt found S.W. of the Dead Sea. The narrative of the incestuous birth of Moab and Ammon is perhaps intended to stigmatise two of the chief enemies of Israel.

Lota. Harbour and coal port of Chile. It is situated on the E. side of Arauco Bay in the province of Concepción, just S. of Coronel. It exports the coal found in the Cousino mines, mainly for use on the state rlys. There is the celebrated Cousino Park. Pop. 34,445.

Lot-et-Garonne. Department of France. An inland region in the S.W., it is in general flat and fertile. The Garonne flows right through it, as does its tributary, the Lot. There are some low hills in the N., while a little of the dept. is in the Landes district. Wheat and other cereals, tobacco, and vegetables are grown, and there are numerous orchards and vineyards. Iron is mined and is worked at Pomet and elsewhere. Agen is the capital, and other places are Marmande, Villeneuve-sur-Lot, and Nérac. The dept. covers 2,078 sq. m., and was formerly partly in Guienne and partly in Gascogne. Pop. (1951) 265,549.

Lothair. Novel by Lord Beaconsfield, considered by many critics to be his masterpiece. It was written in 1870, and relates the story of Lothair, a young and wealthy nobleman who has left England to fight in the war of Italian independence; the central incident is the attempt to win him over to the R.C. Church. The leading characters were taken from real life. Lothair is the third marquis of Bute, who came of age in 1868, and joined the R.C. Church. The duke is the first duke of Abercorn. Cardinal Manning and Bishop Samuel Wilberforce appear under pseudonyms.

Lothair I (795-855). German king and Roman emperor. Eldest son of the emperor Louis I, he was a grandson of Charlemagne. A kingdom was found for him in Bavaria, 815, and in 817 he was crowned joint emperor at Aix-la-Chapelle and in 823 at Rome. He died Sept. 29, 855, in the monastery of Prüm.

By the treaty of Verdun, 843, Lothair divided Charlemagne's empire with his brothers Louis the German and Charles the Bald, a division that gave rise roughly to the modern France and Germany with between them a "middle kingdom" called Lotharingia (after Lothair) stretching from the North Sea to the Alps. It was divided 959 into two parts, the northern half of which later became Brabant, the southern Lorraine, of which the present Lorraine is a part.

Lothair II (c. 1060-1137). German king and Roman emperor. The son of a count in Saxony, he inherited his father's lands and soon became a man of mark there. Although a rebel against the emperor Henry IV, he was for a time more friendly to Henry V, who about 1106 made him duke of Saxony. As such he led the Saxons in their enmity to the family to which Henry V belonged, and until the death of that monarch in 1125 there was constant trouble between him and his powerful vassal. In 1125 Lothair was crowned German king in preference to the late king's nephew, Frederick of Hohenstaufen, and a war with the Hohenstaufen family followed quickly. In this the new king was successful. His later years were passed in Italy, where he was crowned emperor in 1133, and in a renewed quarrel with the Hohenstaufen, which on the whole enhanced his authority in Germany. Lothair died on his return from Italy, Dec. 4, 1137.

Lotharingia. Name of a medieval kingdom of Europe. See Lorraine; Lothair I.

Lothario. Character in Nicholas Rowe's tragedy *The Fair Penitent* (1703). From him is derived the phrase a gay Lothario, signifying a deceiver of women.

Lothbury. London thoroughfare. First called Lodebure, it is N. of the Bank, between Coleman Street and Throgmorton Street, E.C. In the 16th century it was the abode of founders or candlestick makers. The old Founders' Hall which stood from 1531 to 1845 in Founders' Court, was occupied by the G.P.O. The foundation of S. Margaret's Lothbury has been traced back to the 12th century.

The church, rebuilt by Wren in 1690, with a finely carved font by Grinling Gibbons and a wooden chancel screen, belonged to the abbey of Barking until 1540, when the living passed to the crown.

Lothian. A dist. of Scotland which stretched originally from the Cheviot Hills to the Forth, thus including the counties of Berwick, Roxburgh, Haddington, Edinburgh, Linlithgow, and probably Selkirk. Originally a Brythonic dist., it was included in the 7th century in the English kingdom of Northumbria, having probably been conquered by King Ethelfrith. For many years its possession was disputed between the English and the Scots, but after 1018, when the Northumbrians were decisively beaten by Malcolm II, king of the Scots, it was annexed by the latter. At present the Lothians include only the three shires of Haddington, now called East Lothian (*q.v.*), Edinburgh, now Midlothian (*q.v.*), and Linlithgow, now West Lothian (*q.v.*).

Lothian, EARL AND MARQUESS OF. Scottish titles borne by the family of Kerr. Mark, the first earl,



William Kerr,
3rd Earl of Lothian
After Jamieson

belonged to the noted border family of Ker of Cessford. Prominent in Scotland in the time of James VI, he was made Lord Newbattle in 1587 and earl of Lothian in 1606. His son left only a daughter, but she married a Kerr, and so the title remained in the family. This William Kerr became the 3rd earl, and having taken part in public life in England, he died in 1675.

His son, Robert, the 4th earl (1636-1703) inherited also the earldom of Ancrum from an uncle, and was made a marquess for his services to William III in 1701. A succession of marquesses in the direct line followed. The 11th is noticed separately below, and the 12th was Peter Francis Walter Kerr (b. Sept. 8, 1922). The chief seats of the family are Melbourne Hall, Derby, and Monteviot, Roxburghshire. The marquess sits in the house of lords as Baron Ker, and his eldest son is known as earl of Ancrum. The family has adopted the spelling Kerr in preference to Ker (*q.v.*).

Lothian, PHILIP HENRY KERR, 11TH MARQUESS OF (1882-1910). British politician and diplomatist.

Born April 18, 1882, and educated at the Oratory School and New College, Oxford, he edited *The*



11th Marquess of
Lothian

Round Table, 1910-16. Thence until 1921 he was secretary to the prime minister, D. Lloyd George. He succeeded to the peerage in 1930, and in 1931 was appointed chancellor of the duchy of Lancaster in the National govt. Parliamentary under secretary in the India office and chairman of the India franchise commission, he retired from the govt., 1932, on the tariff issue, as a convinced free trader. As British ambassador in Washington from April, 1939, he did much to ensure U.S. friendship for Great Britain during a critical period. An eloquent appeal to the U.S.A. to help Great Britain to the utmost in carrying on the war against Germany was read on his behalf at a banquet in Baltimore, Dec. 11, 1940, and made a great impression. He himself was too ill to attend the banquet, and died the following day.

Lothian Regiment. Another name for the Royal Scots, who are recruited mainly in Edinburgh and the Lothians. Its official title was changed in 1920 from *The Royal Scots (Lothian Regiment)* to *The Royal Scots (The Royal Regiment)*. See *Royal Scots*.

Loti, PIERRE (1850-1923). Pen name of French novelist, Louis Marie Julien Viaud. Born at Rochefort, Jan. 14, 1850, at 17 he entered the navy, becoming captain 1906. He published his first story, *Aziyadé*, in 1879. In 1880 came *Ramain*, reprinted in



Pierre Loti,
French novelist

1882 as *Le Mariage de Loti*, the story of an Englishman and a Tahitian girl, which won him instant popularity, and he rapidly produced a series of somewhat sad, sentimental stories and impressions of travel, which led to his election to the Academy in 1891. Loti's experiences at sea form the background to *Le Roman d'un Espahi*, 1881; *Mon Frère Yves*, 1883. In *Le Pêcheur d'Ishude*, 1886, a tender, tragic romance of Breton life, he broke new ground, but his meth-

choly remained. Later came *Propos d'Exil*, 1887; *Fantôme d'Orient*, 1892; *La Galilée*, 1895; *L'Inde sans les Anglais*, 1903. Loti died, June 10, 1923. *Consult* Life, E. d'Auvergne, 1926

Lotion (Lat. *lotio*, washing). Name for a solution of drugs intended for external use. Lotions may be solutions in water or alcohol, and are known as antiseptic, anti-pruritic, astringent, sedative, or stimulating, according to their uses and contents. Some are known as washes, e.g. mouth washes. Antiseptic lotions may contain boric acid, carbolic acid, etc.; soothing lotions, zinc compounds, calomine, etc.; and stimulating lotions, ammonia, cantharides, etc. Evaporating lotions are prepared with spirits of wine or methylated spirit and water, and are chiefly used for the treatment of sprains and inflammations.

Lotta Svard. Finnish national women's organization. Named after a heroine of the war between Sweden and Russia in 1808-09, the organization became prominent in the Russo-Finnish campaign of 1939-40, when some 100,000 women undertook voluntary non-combatant duties.

Lottery. In English law, a distribution of prizes by lot or chance. In Tudor and Stuart times lotteries were popular in England, and were even promoted by the state as a source of revenue. But they proved so demoralising, and were associated with so much cheating, that in 1802 all lotteries not authorised by parliament were declared illegal. The last state lottery was held in 1826.

The Betting and Lotteries Act, 1934, made legal two kinds of lottery. The first is the small lottery or raffle held at an entertainment such as a bazaar. This will be legal, however, only if the whole proceeds of the entertainment (including proceeds of the lottery), after deductions for certain expenses, are devoted to purposes other than private gain. None of the prizes may be money; tickets must not be resold; nor may the result of the lottery be announced except on the premises during the entertainment.

The second type of legal lottery is the private one promoted for, and the sale of tickets confined to, (1) members of one society established for purposes not connected with gaming; (2) persons who all work on the same premises; (3) persons who all reside on the same premises. The whole proceeds, after deductions for expenses, must

be used either as prizes or for the objects of the society. Detailed rules are laid down in the Act as to what must appear on the tickets and the methods of selling them.

In unlawful lotteries the following acts are illegal: printing the tickets; selling them or advertising the sale; advertising the lottery; publishing a list of prizewinners; publishing anything describing the draw or relating to the lottery which is calculated to induce people to participate; bringing or inviting any person to send into Great Britain any ticket for sale or distribution; sending out of Great Britain any money or valuable thing received in respect of the sale of a ticket or any document recording the sale or identity of the holder. Thus the mere purchase of a ticket is (probably) not an offence. *See* Betting.

Lotti, ANTONIO (1664-1740). Italian composer. Born and educated in Venice, in 1692 he became assistant organist at S. Mark's and in 1736 director of music. Composer of many masses and other pieces of sacred music, he also wrote elegant trios and quartettes, and published a collection of duets and madrigals in 1705. His operas were popular and so widely known that Lotti was invited to Dresden by the elector to write operas for the theatre there, 1717-19. He died Jan. 5, 1740.

Lotto or **KENO.** A gambling game played with special cards, popular in passenger liners. On the cards are marked combinations of numbers from 1 to 90. On each card are arranged three rows of five numbers, there being no duplicate numbers on any one card. Every card bears across its face a distinguishing number which the player must see registered, as he has to pay a certain sum for the card. Any quantity of cards may be chosen. The banker puts 90 small numbered balls into a bag or other receptacle which allows one ball to escape at a time. He calls aloud its number, and the player first to cover with disks the five numbers contained in any horizontal row claims the pool or prize. *See* House.

Lotto, LORENZO (c. 1480-c. 1556). Italian painter. He was born at Venice, and studied under the Vivarini. About 1512 he settled at Bergamo, where many of his paintings are preserved; among them his masterpiece, the *Madonna and Saints of S. Bernardino*. In 1532 he was again at Venice, but in 1552 removed

finally to Loreto, where he died in a monastery. His religious pictures are characterised by ecstatic emotion, and are sometimes highly dramatic.

Lotus. Genus of herbs and subshrubs of the family Leguminosae. They are world-wide in their dis-



Lotus. Flowers and circular leaves of the sacred lotus of India and China

tribution, and five species are recognized as British. The bird's-foot trefoil (*L. corniculatus*), is abundant in every pasture and waste. From a perennial woody root stock tufted stems arise with a spreading habit, and with distant leaves divided into four or five oval leaflets. The clusters of bright yellow, pea-like flowers are in evidence all through summer, and are succeeded by slender, curved pods. There is no connexion between these plants and the lotus of the lotus-eaters, which is supposed to be the jujube-tree (*Zizyphus lotus*), a species of Rhamnaceae and a native of the Mediterranean region.

The sacred lotus of the Egyptians, referred to by Herodotus, which figures in the sculptures of the ancient temples, was a water-lily (*Nymphaea lotus*), while the tamara or sacred lotus of India, China, and Tibet is the *Nelumbium speciosum*. The latter plant figures also on the Egyptian monuments, but less frequently; and as it is no longer found in the Nile, it is supposed that it was an introduction from India. It differs from the other water-lilies in the fact that neither leaves nor flowers float on the surface, but are raised on long stalks above the water. It was accurately described by Theophrastus (368-286 B.C.).

Lotus-eaters (Gr. *Lotophagi*). In Greek mythology, a people whom Odysseus came across in his wanderings. They were accustomed to eat of a fruit called the lotus, which caused those who did so to lose all desire to return to their native country. It has been identified with various plants, more particularly with the jujube (*q.v.*). According to Herodotus, a people of the name inhabited the N. coast of Africa and the island of Morninx (Jerba), also called Loto-

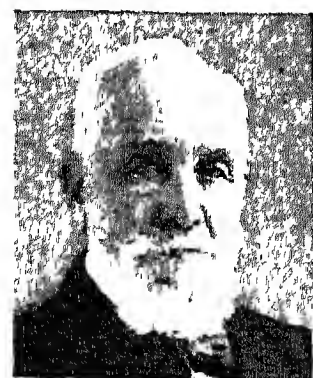
phagitis, in Tunisia, at the entrance to the gulf called Syrtis Minor. The legend is the subject of a famous poem by Tennyson.

Lotze, RUDOLF HERMANN (1817-81). German philosopher. Born at Bautzen, Saxony, May 21, 1817, he qualified at Leipzig in philosophy and medicine. He became professor of philosophy at Göttingen in 1844 and in 1881 at Berlin, where he died during his first term, on July 1. Lotze founded what he called teleological idealism. Starting as a physiologist with the materialism of Herbert Spencer, modified through the influence of Leibniz, Herbart, and Hegel, he regarded the mechanical and individualistic theory of existence as valid, but incomplete. One absolute being, who must be a personal God, is the origin of all that exists; the course of the world proceeds in accordance with a final purpose. Metaphysics has its starting-point, not in itself, but in ethics. Philosophy cannot attain to complete truth; it can only acquire a view of the world, which sets before us valuable aims in life and shows us how to reach them. His most important work is *Microcosmos, Ideas on the History of Nature and of Mankind*, Eng. trans. 4th ed. 1890. *Consult* critical study by H. Jones, 1895.



Rudolf H. Lotze, German philosopher

Loubet, ÉMILE (1838-1929). A French statesman. He was born at Marsanne, Drôme, on the last day of 1838, the son of a peasant proprietor, and studied law in Paris. Admitted to the bar, he was by turns mayor of Montélimar; president of the council of Drôme; deputy for Montélimar, 1876; senator, 1885; minister of public works, 1887-88; premier and minister of the interior, 1892. Then he became president of the senate, 1895, and in 1899 took office for seven years as president of the republic.



Émile Loubet, French statesman
Manuel

As mayor Loubet initiated local improvements and financial economy; as minister of public works he directed a huge scheme for the better drainage of Paris; as

prime minister and president he promoted the better relations of France with Great Britain, Italy, and Russia. Few French statesmen have been more popular. Naturally a student, he kept aloof from party cliques, eschewed needless ceremony, married Marie Denis, daughter of an ironmonger of Montélimar, and was called "the lovable-looking man in the blue sash." He died Dec. 20, 1929.

Loudon, ERNST GIDEON, BARON VON (1717-90). Austrian soldier, born Feb. 2, 1717, in Livonia. His family came originally from Scotland, and his father was an officer in the Swedish service. Ernst entered the Russian army, in which he served against Turkey, but in 1741 transferred his services to Austria and became a Roman Catholic. During the Seven Years' War he won a reputation as a fighting general. Among his successes were victories over Frederick the Great at Kunersdorf and Landeshut, but he was beaten at Liegnitz. Marshal Loudon commanded an army in the war of the Bavarian succession, 1778, and captured Belgrade from the Turks in 1789. His abilities were well rewarded by the Austrian rulers. He died July 14, 1790. *Consult* Life, G. B. Malletson, 1894.



E. G. von Loudon, Austrian soldier

Loudoun. Parish, castle, and hill in Ayrshire, Scotland. The parish is a large one on the river Irvine. Loudoun Castle, about 7 miles E. of Kilmarnock, is an ancient stronghold, restored in the 17th cent., and was long the seat of the earls of Loudoun. The hill is near the borders of Ayrshire and Lanarkshire. Here in 1307 Bruce defeated the English.

Loudoun, EARL OF. Scottish title held from 1633 by the families of Campbell and Abney-Hastings. John Campbell (1598-1663) married a granddaughter of Hugh, 1st Baron Loudoun, and himself took that title. In 1633 he was made an earl, and the title passed to his descendants. The 5th earl was succeeded by his daughter Flora, who married the 1st marquess of Hastings, and the earldom subsequently passed to successive marquesses of Hastings, until the higher title became extinct in 1868. A sister of the 4th marquess then inherited the earldom. Her son, Charles Edward Abney-

Hastings, 11th earl, died in 1920, and was succeeded by his niece, Edith Maud, an countess. The title carries with it the barony of Botreaux (cr. 1368).

Loudspeaker. Sound diffusing portion of a sound reproduction apparatus. The loudspeaker converts audio frequency electric currents into the corresponding sounds, and may be of either the magnetic diaphragm or the moving coil type. Loudspeakers range in strength from the small one incorporated in the home radio receiver to the large one used in the open air which may have a range of 10 m. Loudspeakers on the principle of line telephone systems are used in railway stations to announce train times, in dance halls to ensure synchronisation, and in churches and concert halls to improve acoustics. Similar types at aerodromes and in camps and ships broadcast instructions to personnel. A loudhailer is a special variety enabling ships at sea to communicate by sound over short distances; it has largely replaced the megaphone. *See* Amplifier, Radio; Sound Reproduction.

Loudun. Town of France. In the dept. of Vienne, it is 6 m. S.W. of Tours, with which it is connected by rly. It has an agricultural trade and a few manufactures, but its chief interest is historical. The keep of the castle still stands, and there is also a gateway, a relic of the town's fortifications. The church of S. Croix is now used for secular purposes; S. Pierre is a Gothic building. Loudun was a Roman station, and Roman remains have been found here. In the Middle Ages it was a fortress in the co. of Anjou, and its castle was a residence of the counts.

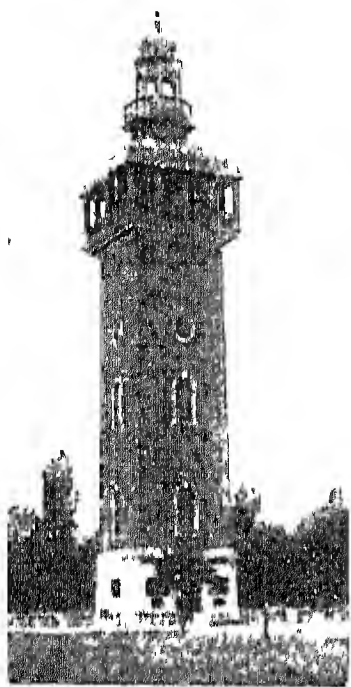
Lough. Irish form of the word loch, used for lakes and for deep coastal indentations. Sea loughs are usually due to glacial action, and many river loughs have been formed by the solution of the limestone bed of a river. *See* Erne; Neagh; Loch.

Loughborough. Mun. borough and market town of Leicestershire, England. It stands on the Soar,



Loughborough arms

10 m. N. by W. of Leicester, and has rly. stations. The chief building is the large old church of All Saints, with a fine tower. There are a technical college (v.i.), a grammar school for boys, and a high school for girls. Other buildings include



Loughborough war memorial, a carillon tower with 47 bells. See also Carillon illus

the town hall and free library. The staple industries concern hosiery, heavy engineering, electrical apparatus, and coach work; also dyeworks and bell-founding. Loughborough, which gives its name to a county constituency, existed in Anglo-Saxon times and had

a market in the Middle Ages, but it was a small place until the introduction of lace manufacture about 1800. This was supplanted by the hosiery trade. The place was made a borough in 1888. Market days, Mon. (cattle), Thurs., Sat. Pop. (1951) 34,731.

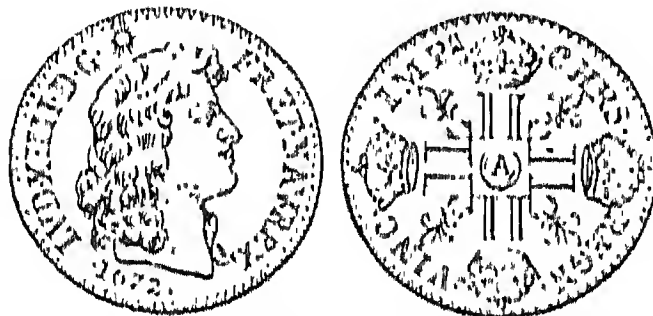
Loughborough College. A school of technical and scientific education at Loughborough, Leics. Founded in 1918, it accommodates 750 students in 16 residential halls. The school of engineering offers courses in mechanical, electrical, automobile, aeronautical, and civil engineering, and maintains its own workshops, generating station, and an aerodrome. Students spend alternate weeks in lecture rooms and in the workshops. The school of applied science gives instruction in chemical technology and engineering, and has facilities for research. There is also a department for the training of teachers. Under a department of physical education come gymnastics and sport, for which there are 120 acres of playing fields.

Loughrea. Market town of co. Galway, Irish Republic. On Lough Rea, 18 m. S.W. of Ballinasloe, it has a rly. station. The chief building is the modern cathedral of the R.C. diocese of Clonfert. The town grew up around a castle built by a Norman baron, and was at one time a fortified place. There are a few remains of a religious house. Market day, Thurs. Pop. (1951) 2,853.

Loughton. Part of the urban district of Chigwell, Essex, England. It is on the Central Line, 11½ m. N.N.E. of Liverpool Street, also served by Green Line, and on the borders of Epping Forest. The 12th century church of S. Nicholas was pulled down in 1817

and the memorial chapel of S. Nicholas built on its site in 1877, some 16th century brasses being preserved. The existing parish church of S. John the Baptist dates from 1846; that of S. Mary from 1871. The public hall was erected in 1883 (see Lopping). Loughton Hall, 1879, stands on the site of a Tudor mansion, rebuilt in the 17th century by Sir Robert Wroth, and burnt early in the 19th century, when the pictures and 10,000 books and MSS. were destroyed. Ben Jonson refers to the gay doings at the hall in his time. The history of the manor or manors goes back to the days of the Confessor. Loughton is mentioned eight times in Domesday, and is associated with the abbots of Waltham and Stratford. It became a royal manor in 1510, and was later incorporated with the duchy of Lancaster. From the family of Wroth it passed to that of Maitland, and is now owned by the L.C.C. Pop. est. 15,000.

Louis or **Louis d'or.** French gold coin. It was minted by Louis XIII in 1640, and continued in use till after the Revolution. It was



Louis. Obverse and reverse of the old French gold coin. ½ actual size

worth about 16s., and half and double louis were also coined. The name is also given colloquially to the 20-franc piece or napoleon.

Louis. A masculine Christian name. Louis is the French form, the English being Lewis, the German Ludwig, and the Italian Lodovico. It originated among the Franks as Chlodwig, and has been popular with rulers, having been borne by 19 kings of France, a number of German emperors and kings, and by kings of Hungary and princes in Italy. The emperor Louis I counts also as Louis I, king of France, as his realm included that country. For kings, Louis is used instead of Ludwig in this work. See Ladislas.

Louis I (778-840). German king and Roman emperor. He was third son of Charlemagne, who had him crowned king of Aquitaine in 781. The deaths of his elder brothers made him the emperor's chief heir. He was crowned joint emperor in 813, and in 814 on Charlemagne's death, became

its head. He died June 20, 840. Louis is called le Debonair and also, for his generosity to the Church and regard for morality, the Pious. His last ten years were spent in warfare with his sons about their respective shares of his empire. One of them was the emperor Lothair, another Louis the German, and the youngest was the emperor Charles the Bald.

Louis II (c. 822-875). German king and Roman emperor. The eldest son of the emperor Lothair I, he was associated as king of Italy with his father in the government of that country from 844, and showed great energy in quelling the disorder in the S. He made many efforts to expel the Mahomedan invaders. He established Pope Benedict III, who was threatened by a rival, in 855, and in the same year, on his father's death, he succeeded to the empire and Italy. On his brother Charles's death in 863, Louis inherited Provence. He recovered Naples and Apulia for the empire, and was preparing to conquer Calabria and Sicily when he died, Aug. 12, 875.

Louis III (880-928). German king and Roman emperor. The son of Boso, king of Provence, and Irmengard, daughter of the emperor Louis II, he was adopted, on his father's death, in 887, by the emperor Charles the Fat. Crowned in Rome by Benedict IV in 901, he was speedily expelled from Italy, but returned in 905, and in July was overpowered at Verona by agents of Berengar of Friuli, blinded, and deposed. He lived thenceforward at Arles, his Provençal capital. By his wife, Adelaide, daughter of Rudolph of Upper Burgundy, Louis became the ancestor of the house of Savoy.

Louis IV (1287-1347). German king and Roman emperor. The son of Louis, duke of Bavaria, he was chosen emperor in 1314 by four electors (others choosing Frederick of Austria, known as the emperor Frederick III or IV. A diet at Nuremberg having confirmed his election Louis defied Pope John XXII, and was excommunicated in 1324. He marched into Italy, was crowned emperor in Rome, January 17, 1328, and set up an antipope, Nicholas V, but had to take flight in Aug. In 1338 an electoral union declared that the election of emperor was valid without confirmation by the pope. Louis seized Lower Bavaria in 1341; Tirol and Carinthia came to his family of Wittelsbach by marriage. In 1346 by his marriage to

a daughter of the count of Holland he inherited Holland, Zeeland, Frisia, and Hennegau. On Oct. 11, 1347, Louis was killed while hunting.

Louis. Name of 18 kings of France. The emperor Louis I ranks as the first of them, as France as well as Germany was in his empire. Louis II was the son of the emperor Charles the Bald. He ruled over the West Franks, as the French were then called, from 877 to April, 879. Louis III was the son of Louis II. He reigned with his brother Carloman over the Franks from 879 to Aug., 882.

Louis IV (921-54). King of France, 936-54. A son of Charles III, he passed his boyhood in exile in England, to which fact he owes his name of Outremer, or beyond the sea. In 936 the French chose him king and, returning, he was crowned at Laon. His reign was mainly spent in fighting his numerous foes who included the emperor Otto the Great. During a war with the Normans he was captured, and for about three years was the prisoner of Hugh the Great, count of Paris. The king died from the effects of a fall while hunting, Sept. 10, 954. His successor was his son Lothair.

Louis V (c. 967-987). King of France, 986-87. The son of Lothair, he began to reign in March, 986, and died in May, 987. He was the last of the Carolingian kings, and his successor was Hugh Capet.

Louis VI (1078-1137). King of France, 1108-37. His father, Philip I, made him joint king in 1100, and left the government in his hands. His great rival was Henry I of England, and Louis surrendered Brittany and Maine by the peace of Gisors, 1113. To check the nobles Louis favoured the peasants and burghers, established communes, granted charters, and asserted his authority in the provinces by commissioners. Louis VI died Aug. 1, 1137.

Louis VII (1120-80). King of France, 1137-80. After reigning for six years jointly with his father Louis VI, he succeeded him in 1137, marrying in the same year Eleanor, heiress of Aquitaine, who, after he had divorced her, married Henry of Anjou, 1152, bringing him Guienne and Poitou. Henry having succeeded to the English throne two years later, a struggle between the two kings broke out in 1157, and lasted intermittently for 20 years. The English king's power grew until 1173, when Louis attacked him at the head of a great alliance which included Flanders, Scot-

land, Normandy, Brittany, and Henry's rebellious sons. The design failed, and peace was made at Ivry in 1177. Louis died Sept. 18, 1180.

Louis VIII (1187-1226). King of France, 1223-26. Born in Paris, Sept. 5, 1187, he was the eldest son of Philip Augustus. He assisted his father in his war against England, and in 1216, answering an invitation of some English barons, he invaded that country in order to depose John. He met with a number of successes, but, in 1217, John being then dead, he was beaten at Lincoln and by a treaty agreed to give up his claim. He then

took part in the crusade against the Albigenses. In 1223 Louis became king, but he only reigned until Nov. 8, 1226, when he died at Montpensier. In that short time, however, he had captured Poitou from the English, and had taken Avignon and crushed the religious insurgents in Languedoc. He married Blanche, daughter of Alphonso, king of Castile. Of their large family the eldest son was St. Louis.

Louis IX (1214-70). King of France, 1226-70, canonized as St. Louis, 1297. Born at Poissy, April 25, 1214, he was son of Louis VIII and Blanche of Castile. His mother



Louis IX a prisoner of the Saracens after his defeat at Damietta. From the painting by A. Cabanel in the Panthéon, Paris

subjected him to a rigorous religious training, and his personal piety caused him to become known as perhaps the most devout of monarchs. His father died in 1226, and his mother, acting as regent, did much to curtail the power of the great feudal nobles, so that when he took up the work of administration in 1236 he was free to devote himself to the task of regulating civil affairs, setting up departments for the control of government, justice, and finance. Frank and affable, though modest and reserved, he showed himself as precise in worldly as in spiritual matters.

In 1242 he forced Henry III of England to renounce his claims to Normandy, Anjou, Maine, and Poitou, and in 1249 directed the sixth crusade, attempting to reach Palestine through Egypt; but although he took Damietta, he was forced to retreat, and was ultimately captured, 1250, with the remains of his army. Upon payment of a heavy ransom he was soon set at liberty, and succeeded in reaching Palestine, where, however, he accomplished nothing of military importance. Returning to France in 1254, he prepared another crusade, against Tunis. But when besieging that city in 1270 he fell a victim to the plague, and died Aug. 25, kept as his feast.

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Louis X (1289-1316). King of France, 1314-16. Eldest son of Philip IV and Joanna of Navarre, he was born Oct. 4, 1289, and succeeded his father Nov. 29, 1314. A weak prince, he was controlled by his uncle Charles of Valois, and was powerless against the turbulent nobles, who formed a league for the restoration of their old privileges, and wreaked vengeance on the officials of the late king. Opposed also by the Church and the communes, Louis endeavoured to gain the provinces by charters, and enabled serfs to purchase freedom. He also sold offices to raise money for a war with Flanders. He died suddenly, June 5, 1316, and was succeeded by his brother Philip V.

Louis XI (1423-83). King of France, 1461-83. The son of Charles VII, he was born at Bourges, July 23, 1423. The story of his reign is that of the consolidation of modern France. His democratic leanings, real or assumed, were to some extent responsible for raising the status of the lower and middle

classes, from whom he chose his most trusted counsellors, while jealously curbing the power of the nobility. Coarse in his pleasures and choice of associates, cruel and sensual, he was nevertheless a man of extraordinary subtlety, great administrative capacity, and of the highest personal courage.

Louis, who had embittered the last years of his father's life by his continual intrigues, succeeded him in 1461. Pitiless taxation brought about a general revolt in 1465, which resulted in the remission of certain burdens. Louis was made prisoner by his powerful rival, Duke Charles of Burgundy, while on a visit to that ruler in 1468, and only escaped execution by dint of many promises. Treachery on both sides brought the hostilities which ensued to a speedy close. In 1473 coercive measures of the most infamous kind were taken against the nobility, who had proposed to assign the crown to Edward IV of England. Edward landed in France with a large army, but was bought off, and Louis's cajolery rendered the invasion nugatory. Louis died at Plessis-le-Tours, Aug. 30, 1483.

Bibliography. Mémoires, P. de Comines, 1649; Lettres, J. Vaesen and E. Charavay, 1883; P. Pasquier, 1895; Life, C. Hare, 1907.

Louis XII (1462-1515). King of France, 1498-1515. A son of Charles, duke of Orleans, the poet, he was descended from Charles V, but did not become heir to the throne for some years. He married Jeanne (canonised 1950), a daughter of Louis XI, and as duke of Orleans was active during the reigns of that king and of Charles VIII. Under the latter he led a revolt which resulted in his imprisonment, but he was soon free, and in 1494 he served with the French forces in Italy. In April, 1498, he became king on the failure of direct heirs to Charles VIII.

Asserting his right as heir to the Two Sicilies and, as grandson of Valentina Visconti, to Milan, Louis invaded Italy in 1499 with Ferdinand of Spain, a project which led to a prolonged rivalry between France and Spain. He secured the prov. of Brittany by marrying Anne of Brittany, widow of his predecessor, after the annulment of his first marriage. In 1508 he entered with Pope Julius II, the emperor, and Ferdinand into the league of Cambrai, the purpose of which was to quell the growing power of Venice, but once its pretensions had been checked, he drifted into hostilities with Julius and by the great victory of Ravenna in 1512 subjugated practically the whole of

Italy, which, however, he was unable to retain. A quarrel with Henry VIII of England led to the defeat of the French at Guinegate, near Calais, in 1513, and the ensuing treaty of Orleans was disadvantageous to France.

Louis took, as his third wife, Mary, sister of Henry VIII, but survived the wedding by only three months, dying Jan. 1, 1515. In 1506 he had received by public acclamation the title of father of his people, proof that, despite his many military misfortunes and unwise foreign policy, he was appreciated by his subjects for the many political advantages he had conferred upon them. *Consult* Louis XII et Anne de Bretagne, P. Lacroix 1882; Histoire de Louis XII, A. R. de Maulde, 1889-93.

Louis XIII (1601-43). King of France, 1610-43. The son of Henry IV and Mary de' Medici, he was born Sept. 27, 1601, and came to the throne on the death of his father in 1610. A spoilt child, he received the worst possible guidance from his mother, and from the first was plunged in an atmosphere of court intrigue, to which his weak character was never able to rise superior.

The absence of settled government and the menace of the Protestant party centred at La Rochelle precipitated civil war in 1619, and after a conflict of two years, in which the king, the great nobles, and the queen dowager opposed each other in ever-varying combinations, the rise of Richelieu introduced stability into affairs. He reduced La Rochelle in 1628, and succeeded in gaining absolute influence over the weak Louis, who, though courageous as a military leader, was no match for the astute churchman in diplomatic affairs. The establishment of a central power uncontrolled by nobles or parliament was achieved, and by the efforts of the cardinal the French crown became more powerful than at any former period.

This elevation awoke an inordinate pride in Louis, who became dead to all natural feelings and acquiesced in the insults which Richelieu directed at his mother, brother, and queen, the unfortunate Anne of Austria. He died May 11, 1643, leaving a reputation for personal courage, combined with a weak understanding. He left two sons, Louis XIV and Philip, duke of Orleans.

Bibliography. Louis XIII et Richelieu, M. Tassin, 1876; Histoire de Richelieu, G. Hanotaux, 1893-1903; Louis XIII d'après sa correspondance avec Richelieu, R. de Beauchamp, 1902; Court of Louis XIII, K. A. Patmore 1909.

Louis XIV (1638-1715). King of France, 1643-1715. A son of Louis XIII and Anne of Austria, he was born at St. Germaine-en-Laye Sept. 5, 1638. He became king before he was five, and was educated for that position. In 1660 he really began to rule, in the same year marrying Maria Theresa, a Spanish princess.

Louis reigned for 72 years, one of the most glorious periods in the history of France. For much of it her armies were invincible, but it was more notable for its art and literature, while the influence of the court on manners and taste can hardly be exaggerated. Of all the national activities, Louis was the centre. His industry was tremendous and he spoke truly when he said "the state, it is I." His hand was in almost every move of European politics, planning aggressions, arranging campaigns, buying alliances; he attended personally to all, and also found time to build palaces, to encourage literature and art, and to take a fill of pleasure.

Louis carried on a series of wars, the main object of which was to make him the dictator of Europe. By 1678 he had achieved a great measure of success, but afterwards he was less fortunate, and the treaty of Utrecht (1713) was a deep humiliation to France. He did, however, extend his country's boundaries, while for fifty years he was the most influential figure in European politics. After the death of Maria Theresa in 1683, Louis married his mistress, Mme. de Maintenon, who had great influence, and is regarded as being responsible for the interest in religion, or perhaps rather in orthodoxy, that marked his concluding years. His earlier mistresses included Mlle. de la Vallière and Mme. de Montespan. His son Louis, and his grandson, the duke of Burgundy, died before him, leaving his great-grandson, afterwards Louis XV, his heir. Natural children included two sons by Mme. de Montespan, who were legitimatised. Louis died Sept. 1, 1715.

As a man Louis did not possess exceptional abilities of any kind, but he was certainly great

as a king. He impressed himself upon his age as no modern sovereign has ever done, and stands out as the ruler who more than any other typifies kingship. Although his colossal vanity was accompanied by a good deal of practical sense, his extravagance and selfishness cost France dear. In the sun king, the grand monarch as he called himself—are seen both the best and the worst of absolute monarchy.

Bibliography. *Siècle de Louis XIV*, Voltaire, 1751; *Memoires of Saint Simon*, Eng. trans., 1899; *Louis XIV*, A. Hassall, 1895; *Histoire de France*, vols. 7-8, ed. E. Lavisse, 1901; *The Age of Louis XIV*, Lord Acton, 1902; *Louis XIV*, Sir C. Petrie, new ed. 1940.

Louis XV (1710-74). King of France, 1715-74. Son of Louis, duke of Burgundy, he was the great-grandson of Louis XIV, to whose throne he became heir in 1712. Born Feb. 15, 1710, his mother being a princess of Savoy, he was educated under the direction of Fleury. At five he became king and in 1723 was declared of age, but the conduct of affairs was not in his hands until 1743, and then only partially.

His long reign was one of misfortune for France. The Seven Years' War ended in a humiliating peace, while the financial condition of the country grew steadily worse, and without ability or industry Louis did nothing to avert the approaching cataclysm. His private life is generally regarded as more than usually scandalous. He had a succession of mistresses, of whom Mme. de Pompadour and Mme. du Barry are best known, while stories are told of his seraglio in the Parc aux Cerfs. He married in 1725 Marie Leezczynska, daughter of Stanislaus, the deposed king of Poland. Undeservedly, he won the

title of Louis the Well beloved because, during an illness in 1714, a good deal of anxiety was shown for his recovery. This feeling was not in evidence when he died, May 10, 1774, to be succeeded by his grandson, Louis XVI. The saying attributed to Louis, "After me the deluge," characterises the man and the age. *Consult* *The Real Louis XV*, A. C. P. Haggard, 1906; *Louis XV and His Times*, P. Gaxotte, 1934.

Louis XVI (1754-93). King of France, 1774-92. Born at Versailles Aug. 23, 1754, the son of Louis, the dauphin, and a grandson of Louis XV, he became heir to the throne in 1763 and at 19 became king. For 15 years he ruled, while the condition of the country grew steadily worse, and then, in 1789, came the Revolution. He remained on the throne for a further three years, although his power sank to zero. In June, 1791, he fled to Varennes, but he was brought back to Paris, where he took an oath to reign as a constitutional king. In Sept., 1792, the kingly office was abolished.

Louis Capet, as he was called, was without any justification tried, found guilty of treason against the republic, and on Jan. 21, 1793, was guillotined; his wife, Marie Antoinette, a Hapsburg princess, whom he had married in 1770, shared his fate. Their elder son died before his parents; a son and a daughter remained—the titular Louis XVII, and Marie Thérèse, who survived the horrors to which she was submitted, and died in 1841. Louis XVI's intentions were good, and his personal character formed a pleasing contrast to that of his grandfather, but he lacked entirely political insight and judgement. *Consult* *Louis XVI and Marie Antoinette*, A. C. P. Haggard, 1909.

Louis XVII (1785-93). Nominal king of France, 1793-95. The second son of Louis XVI, he was born at Versailles, March 27, 1785. In 1789, on his elder brother's death, he became heir to the throne which he never ascended. In Aug., 1792, he was taken to the Temple, and from then onwards the boy's history is



Louis, kings of France. Left to right, Louis XI, 1461-83; Louis XII, 1498-1515; Louis XIII, 1610-43; Louis XIV, 1643-1715; Louis XV, 1715-74; Louis XVI, 1774-92; Louis XVII, titular king, 1793-95; Louis XVIII, reigned de facto, 1814-24

largely conjecture. He became nominally king on the execution of his father, Jan. 21, 1793, but he remained in the Temple, and in June, 1795, his death was announced. Some think, however, that he escaped, and after the restoration of the Bourbons a number of persons claimed to be he. *Consult* The Dauphin, G. Lenôtre, Eng. trans. 1922; The Shadow-King, H. R. Madol, Eng. trans. 1930.

Louis XVIII (1755-1824). King of France. Grandson of Louis XV and brother of Louis XVI, he was born at Versailles, Nov.

Louis 17, 1755. Intensely jealous of Marie Antoinette, Monsieur, as he was styled, was involved in all the court intrigues, and at the first murmuring of the Revolution posed as a friend of the people. He remained in Paris until the flight of Louis XVI, when, more fortunate than his brother, he succeeded in making his way to Coblenz. Here he figured as the head of the Royalists, declared himself regent after the execution of Louis, and on the death of the dauphin, in 1795, proclaimed himself king as Louis XVIII. The next 12 years he spent wandering about Europe, welcomed nowhere, and reduced at times to extreme poverty.

In 1807 Louis went to England, where he remained until the victory of the Allied armies in 1814 opened the way to Paris. He entered his capital May 2, but after some months of unsatisfactory government, was obliged to take flight on Napoleon's escape from Elba. Once again, after Waterloo, he returned to Paris, July 8, 1815, to reign until his death. Crippled with gout and enfeebled by his life of disappointments and wanderings, he passed from the hands of one favourite to another and failed to establish his government on a firm basis by the granting of such constitutional reforms as the age demanded. He died Sept. 16, 1824, and, his marriage having been barren, the throne passed to his brother, Charles X. *See* Louis XVIII, M. F. Sanders, 1910.

Louis I (1786-1868). King of Bavaria. A son of Maximilian Joseph, who became in 1799 elector and in 1806 king of Bavaria, he was born at Strasbourg, Aug. 25, 1786. Politically hostile to France and a sympathiser with liberal ideas, he showed this latter trait after 1825, when he became king, and the earlier years of his reign formed a period of enlightened progress in politics, in education and culture, and in industry. He also sym-

pathised with the desire of Greece for independence.

Louis became less liberal in his ideas as years went on, or allowed his advisers to make him so. In



Louis, kings of Bavaria. Left to right, Louis I, Louis II, and Louis III

1846 he formed a connexion with the dancer Lola Montez, who used her influence especially against the dominant Catholic party. This was followed by the unrest of 1848, and the king's abdication on March 20. Louis lived on, partly in Rome, until Feb. 28, 1868. He had four sons, one of whom was Otto, king of Greece, and another his successor, Maximilian II. Munich owed to him its finest buildings and its great art collections.

Louis II (1845-86). King of Bavaria. The eldest son of King Maximilian II, he was born Aug. 25, 1845. His interests were in art and music rather than affairs of state, of which he was quite ignorant when he became king in 1864. His ministers committed Bavaria to the side of Austria in 1866 and to that of Prussia in 1870. He became friendly with Richard Wagner, to carry out whose expensive ideas he provided immense sums, a course that made both very unpopular with the Bavarians. He had other favourites, and soon developed symptoms of mental derangement, one symptom of which was a desire for solitude. To gratify this whim great sums were spent on residences at Hohen Schwangau and elsewhere, on the performance of plays with himself as the only spectator, and on other eccentricities. In June, 1886, he was declared incapable of ruling. His uncle Luitpold became regent on June 10, and on June 13 the king and his doctor were drowned in the lake of Starnberg. *Consult* Romance of Ludwig II; Life, F. M. Ofen, Eng. trans. 1937. F. Gerard, 1899.

Louis III (1845-1921). King of Bavaria. A son of Prince Luitpold, and grandson of King Louis I, he was born Jan. 7, 1845. In 1868 he married the archduchess Maria Theresa of Austria-Este-Modena. On the death of his father, Dec. 12, 1912, he succeeded him as regent of Bavaria, King Otto being insane. Proclaimed king Nov. 5, 1913,

he abdicated Nov. 9, 1918, and died, Oct. 17, 1921. *See* Bavaria.

Louis I (1326-82). King of Hungary and Poland. A son of Charles Robert, king of Hungary, he became king in 1342. His reign was one of warfare, in which he was usually successful; this and his dealings with other kings in the interests of his country won

for him the title of the Great. He fought Venice for the possession of Dalmatia, which was given to him in 1358, and a further war (1378-81) confirmed his possession thereof. He was less successful, however, in his efforts to secure Naples. In 1370 he succeeded his uncle Casimir as king of Poland, and about the same time was involved in a war with Turkey. He died Sept. 10, 1382, leaving two daughters, of whom one was to have Hungary and the other Poland. *See* Hungary; Poland.

Louis II (1506-26). King of Hungary and Bohemia. The son of Ladislas, king of Bohemia, who had been chosen king of Hungary in 1490, he succeeded his father in March, 1516. As he grew up he cared only for pleasures, and was incapable of governing his two troubled kingdoms. The Turks steadily advanced against Hungary, and Louis could obtain no aid from foreign powers, except from the emperor Charles V, whose troops, however, arrived too late. The loyalty of John Zapolya being suspected, the young king assumed the command of his little army, which was utterly overthrown by the sultan Solymán at Mohács, Aug. 29, 1526. Louis was drowned while taking flight. The royal house of Hungary and Bohemia being extinct, the vacant thrones were conferred on Ferdinand of Hapsburg. *See* Ferdinand I; Mohács.



Louis II, King of Hungary

Louis (c. 804-876). King of the Franks, called the German. A younger son of the emperor Louis I, and a grandson of Charlemagne, he received Bavaria and the lands E. of it in 817, and in 825 he began to rule this kingdom, his capital being Ratibon. He was also occupied in

the constant quarrels in the royal family, which came to a head when the old emperor died in 840. War broke out, the result being the important treaty of Verdun (843), by which the empire was divided among Louis and his two brothers. In 869 Louis and his half-brother, Charles the Bald, agreed to divide the lands of their dead nephew, Lothair. Louis died Aug. 28, 876.

Louis (893-911). German king, called the Child. Through his father, Arnulf, he was descended from Charlemagne, of whose house he was the last representative in Germany. He was only a child on Arnulf's death in 899, and the government of Germany was placed in the hands of Otto, duke of Saxony, and Hatto, archbishop of Mainz. He died Sept. 24, 911.

Louis, COUNT OF NASSAU (1538-74). Dutch soldier. Born Jan. 10, 1538, at Dillenburg, he was a

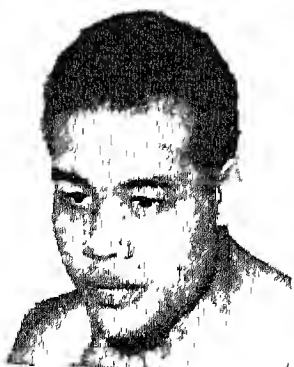


Louis of Nassau,
Dutch soldier

younger brother of William the Silent, prince of Orange (*q.v.*). He became the head of the party known as the Gueux, or Beggars. Retiring to Germany, he was

summoned to appear before the Council of Blood, but replied by entering the Netherlands with an armed force. Defeated at Jemmingen, he withdrew to Germany, and raised a force to aid the Huguenots in France. After sharing in the defeat at Moncontour in 1569, Louis surprised Mons, and on its recapture again went to Germany. He invaded the Netherlands, but was defeated and slain, with his brother Henry, on the heath of Mook, April 14, 1574.

Louis, JOE (b. 1914). American boxer. Joseph Louis Barrow was born near Lexington, Ala., May 13, 1914. Entering the championship ring in 1934, this negro made over two million dollars from 57 contests up to 1942, of which with his tremendous punch he won 49 by knock-out and seven on points. The only opponent to beat him was Max Schmeling, June 19, 1936. Louis became the youngest world heavyweight champion by beating J. J. Braddock, June 22, 1937,



Joe Louis,
American boxer

and met over 20 challengers for his title including Schmeling, the Welshman Tommy Farr, and Max Baer. Louis, nicknamed the "brown bomber" and renowned for his clean fighting, retired undefeated in 1949.

Louisa. Christian name, the feminine of Louis. The form Louise is frequent in England and France. Louisa Dorothea (1710-67), wife of Frederick II, duke of Saxe-Gotha, made her court a centre of culture. Louisa Ulrika (1721-82), a sister of Frederick the Great, married Adolphus Frederick, king of Sweden. She founded an academy at Stockholm. Louise of Savoy (1476-1531), the mother of Francis I of France, took a leading part in the politics of her time.

Louisburg. Town and port of Cape Breton, Nova Scotia, Canada. It is 25 m. S.E. of Sydney, on the Sydney-Louisburg rly. Standing on a fine harbour, it has important fisheries. Pop. 1,012.

The interest of Louisburg is mainly historical. On the opposite side of the harbour stood the greatest French fortress in the New World. By the treaty of Utrecht, France gave up Nova Scotia, but retained Cape Breton and certain fishing rights. On Cape Breton the French built a strong fortress which they called Louisburg. In 1745 the colonists in the New England states, having suffered much from French competition in the fisheries, sent an expedition against it. The home government aided with a fleet, and in March, 1745, the siege began. The fortress held out until June 27. It was kept by the British until 1748, when it was restored to France by the treaty of Aix-la-Chapelle. In 1758 it was again attacked by a force of 12,000 under Amherst, and a fleet under Boscawen, which assembled at Halifax, and the men landed, Wolfe taking a prominent part in this operation. After the French fleet had been destroyed, the place surrendered. The old fortifications, dismantled at the surrender, now form part of the Louisburg natural historic park.

Louise (1848-1939). British princess, known also as the duchess of Argyll. The sixth child

and fourth daughter of Queen Victoria and Prince Albert, she was born March 18, 1848, and

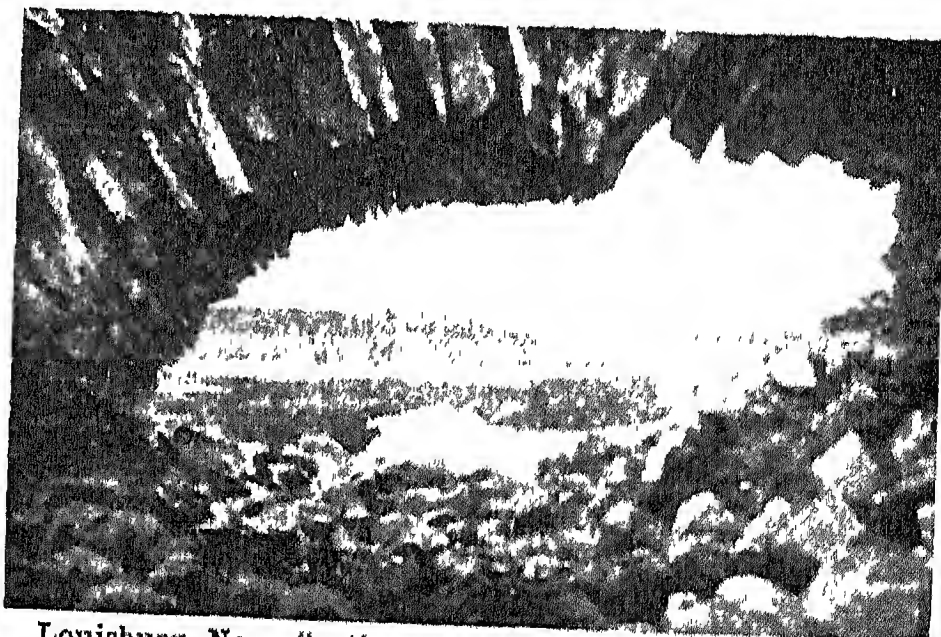


Princess Louise,
Duchess of Argyll

baptized Louisa Caroline Alberta. She was educated privately, and on March 21, 1871, was married to the marquis of Lorne, afterwards 9th duke of Argyll.

She accompanied him to Canada when he was governor general. The princess, who had no children, was left a widow in 1914, and devoted herself to charitable pursuits. She died Dec. 3, 1939.

Louise (Ger. *Luise*) (1776-1810). Queen of Prussia. Daughter of Duke Charles of Mecklenburg-Strelitz, she was born at Hanover, March 10, 1776, and on Dec. 24, 1793, married the crown prince of Prussia, who in 1797 became King Frederick William III (*q.v.*). Her high character and spirit endeared her to the Prussians, especially when, in 1807, she visited Napoleon at Tilsit and vainly tried to induce him to



Louisburg, Nova Scotia. View of the harbour from the ruins of the old French fortress

mitigate the terms imposed on Prussia. She died July 19, 1810, and was commemorated by the Louise foundation for educating girls and the Order of Louise.

Louisiade. Archipelago, or group of islands, off the S.E. extremity of New Guinea. Included in the Australian Commonwealth Territory of Papua (*q.v.*), the largest are Tagula, Rarcel, St. Aignan, Joannet, and Pige. There are numerous small islets, or atolls, and reefs included in the archipelago. The largest islands are mountainous, having peaks rising from 2,800 ft. to 3,400 ft. The islets are low and mostly of coral formation. Gold is found on some of the larger islands, which are

inhabited mostly by Papuan and Melanesian savages. Discovered by Torres in 1606, they were occupied by the British in 1888, and taken over by Australia in 1901.

In March, 1942, the Japanese occupied the is., which gave them command of the N. entry into the Coral Sea, and established airfields. Australians recaptured the is., May, 1944.

Louisiana. Former French province in N. America, much larger than the present state. La Salle sailed down the Mississippi, and took possession of the region in the name of Louis XIV, in whose honour he named it Louisiana, April 9, 1682. It extended nominally from the British colonies in the E. to those of Spain in the W., and from the present Manitoba and the Great Lakes, to the Gulf of Mexico. The Rocky Mts. were regarded as dividing it from Spanish territory, except that Texas was not claimed by France. An unsuccessful proprietary colony under Antoine Crozat during 1712-17, Louisiana was granted to John Law's Mississippi Company. The new scheme failed through wild speculation, and in 1732 the province reverted to the crown.

On the loss of Canada, the left bank of the Mississippi, except New Orleans, was ceded to Great Britain by the peace of Paris, 1763, the remainder passing to Spain, which did little to develop the country. Talleyrand urged Spain to realize the necessity of a strong barrier between the U.S.A. and Mexico, and on Oct. 1, 1800, by the secret treaty of St. Ildefonso, Louisiana was restored to France. In Dec., 1803, France sold the province to the U.S.A. for £3,000,000. More than 1,100,000 sq. m. were transferred. The coast region of W. Florida to the Perdido river was claimed as part of Louisiana, but remained Spanish till 1819.

Louisiana. S. central state of the U.S.A., on the Gulf of Mexico at the mouth of the Mississippi. The coastal region is swampy and subject to inundation, sometimes due to hurricanes as in 1957 when a wind swept inland at 105 m.p.h. causing some 300 deaths and making 40,000 homeless. The N. and N.E. of the state are upland whence it slopes away gradually S. There are forests of pine, cypress, oak, etc. The main source of cane sugar in continental U.S.A., Louisiana is also the leading rice producer; vegetables and fruit are grown. Area 48,523 sq. m.

Louisiana has a thriving fishing industry, sulphur and salt mines and petroleum wells and refineries, and manufactures associated with the products of the land. With 4,794 m. of navigable waterways - more than any other state - Louisiana has also 4,276 m. of rlys. There are a state and other universities, and an agricultural and other colleges. Baton Rouge is the capital, but New Orleans is the largest city. Pop. (1950) 2,683,516. Louisiana is unique among the states for its strong French element and continuing use of Creole French. Many of the inhabitants are descendants of French royalists who sought asylum during the Revolution. It became part of the U.S.A. by purchase in 1803, and was admitted to the union in 1812. It sends two senators and 8 representatives to congress.

Louisiana. A city of Missouri, U.S.A., in Pike co. On the Mississippi river, 93 m. N. by W. of St. Louis, it is served by rly. Among its industries are nursery gardening, stone quarrying, flour milling, and the manufacture of boots and shoes, lumber products, tools, tobacco, cigars, and carriages. It also carries on trade in cattle, fruit, and agricultural produce. Founded in 1818, Louisiana was incorporated in 1845 and became a city four years later. Pop. (1950) 4,389.

Louis Philippe (1773-1850). King of the French, 1830-48. Eldest son of Louis Philippe, duke



Louis Philippe

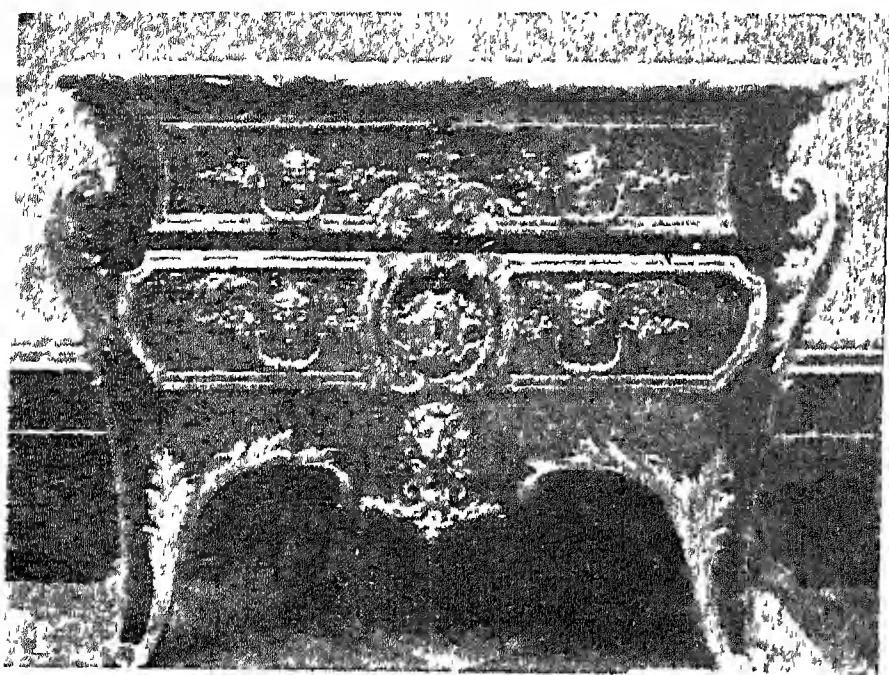
of Orleans (who took the name Philippe Égalité when hereditary titles were abolished 1792) he was born Oct. 6, 1773. Like his father, he professed revolutionary principles, repudiated his titles, and became a colonel of dragoons in the revolutionary army, fighting at Valmy and Jemappes. After his father's execution, 1793, he became head of the Orleans branch of the Bourbons, which was descended from a son of Louis XIII. The government having ordered his arrest, he fled with Dumouriez to Switzerland, and spent many years wandering about Europe. At the court of Palermo, in 1809, he married a daughter of Ferdinand, king of the Two Sicilies. Reinstated in 1814, he was driven from France by the hostility of Louis XVIII, and lived at Twickenham until 1827.

His opportunity came with the revolution of 1830, when Charles X and his family were expelled. The bourgeois constitutionalists, who had made the revolution, invited Louis Philippe to the throne. He accepted as a citizen king, the chosen of the people. His precarious task was to steer a middle course between democracy and privilege, to guard material interests, and to maintain peace. For the first few years of his reign, and again in 1840, France was on the verge of revolution. The king opposed the rising tide of republicanism and socialism by maintaining a limited franchise, muzzling the press, curtailing the jury system, and by bribery.

A close entente with England soon turned into covert hostility, largely as a result of the spirited foreign policy of Palmerston. Studiously avoiding foreign complications, the government seemed to the ardent idealists who carried on the Napoleonic tradition to be compromising the national honour. The support given to Belgium, and the conquest of Algeria, in which two of the king's sons played a part, failed to make the constitutional monarchy popular, while the intervention in Spanish affairs caused scandal abroad. The dismissal of Guizot came too late to avert the revolution of Feb., 1848. Louis Philippe fled to England, and died at Claremont, Surrey, Aug. 26, 1850. His eldest son, Louis, duke of Orleans, had died in 1842, leaving a son, the count of Paris. *Consult* Public and Private Life, L. G. Michaud, Eng. trans. 1851.

Louis Style. Term applied to four styles of French furniture, and named after Louis XIII, XIV, XV, and XVI. The Louis Treize (XIII) was a reaction against the Henri Quatre, with its riot of pilaster, entablatures, contorted cornices, and superabundance of carving and painting. Louis Treize chairs were small, rectangular in contour, with slight wood frames concealed by well-padded velvets, tapestries, and embroideries, fastened by round-headed brass nails. Arms were rarely padded; the legs were joined by stretchers. Armoires, chests, and desks were embellished by inlay of coloured woods, ivory, and bone, depicting flowers and birds. Walls were panelled and adorned with large mirrors.

Louis Quatorze (XIV) was a heavy classic style, but florid; the furniture being overloaded with carvings, rich inlays (such as those of Boulle), and heavy, carved



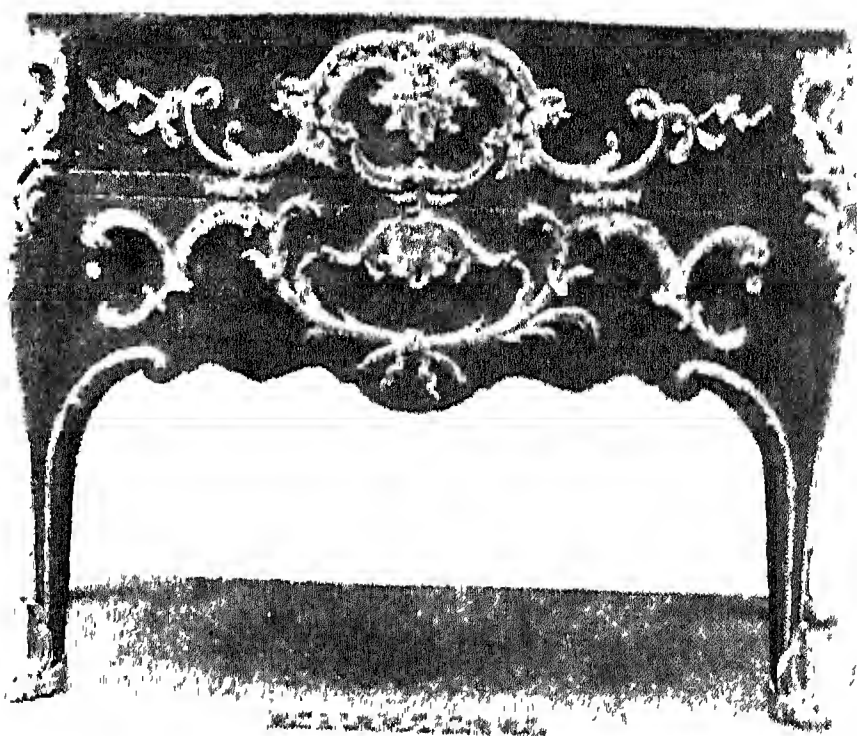
metal mountings. Chairs had tall backs, square or V-shaped; sofas were ample in size, and rich brocades and tapestries of florid design were used. Cabinets were large, glazed, and often bowed.

Louis Quinze (XV) is the florid rococo style. Wood was heavily carved, or covered with composition, moulded into enrichments of shells, rocks, waterfalls, and scrollwork, among which were doves, cupids, heads, and busts of women terminating in foliage. Most of this was gilded, or painted in delicate tints. Couches and chairs had sweeping, curved backs, upholstered in tapestries with flowers, figures, and animals, or flowered brocades, the woodwork gilded. Cabinets were replaced by bow-shaped commodes and *bonheurs-du-jour*, little cabinets on tables, like low-boys. There were also corner cabinets and little round tables (*guéridons*) enriched by inlays of birds, figures, and landscapes, carried out in natural tinted and stained woods.

Louis Seize (XVI) is a more chaste version of the Renaissance, presenting rectangular panels with simple mouldings, fluted columns, with quill and husk fillings. Dainty ribbons and bows in marqueterie or ormolu surrounded richly painted Sèvres plaques, while silver was introduced to tone down the gilding. Red and green were the predominating colours. Tapestry of Beauvais and the Gobelins and silks were used for upholstery. Chair backs were rectangular or oval; the legs tapered, fluted, and connected by stretchers. See Chair; Furniture.

Louisville. City of Kentucky, U.S.A., the co. seat of Jefferson co. Situated 90 m. S.W. of Cincinnati, 130 m. by river and 110 m. by rail from that city, on the Illinois Central and other rlys., it is a river port on the lower Ohio, here obstructed by rapids, which provide hydro-electric power. The

city has a river front of 7 m., and is a great rly. junction with three rly. bridges. The oldest municipal university in the U.S.A., it is the chief of a large number of educational institutions, and among the U.S. government institutions are the only coastguard



institution in the interior, a federal reserve bank, a marine hospital, and a fish hatchery. At Fort Knox, 33 m. to S.W., the U.S. gold reserve is stored (see Knox, Fort). Cherokee and Iroquois are the largest of many parks. A great trading and manufacturing centre, the city is a market for leaf tobacco, and its manufactures include tobacco and cigarettes, Bourbon whisky, processed meat, machinery, leather, and timber goods. Incorporated as a town in 1780, it became a city in 1828. Pop. (1950) 369,129.

The Kentucky Derby is held here in May.

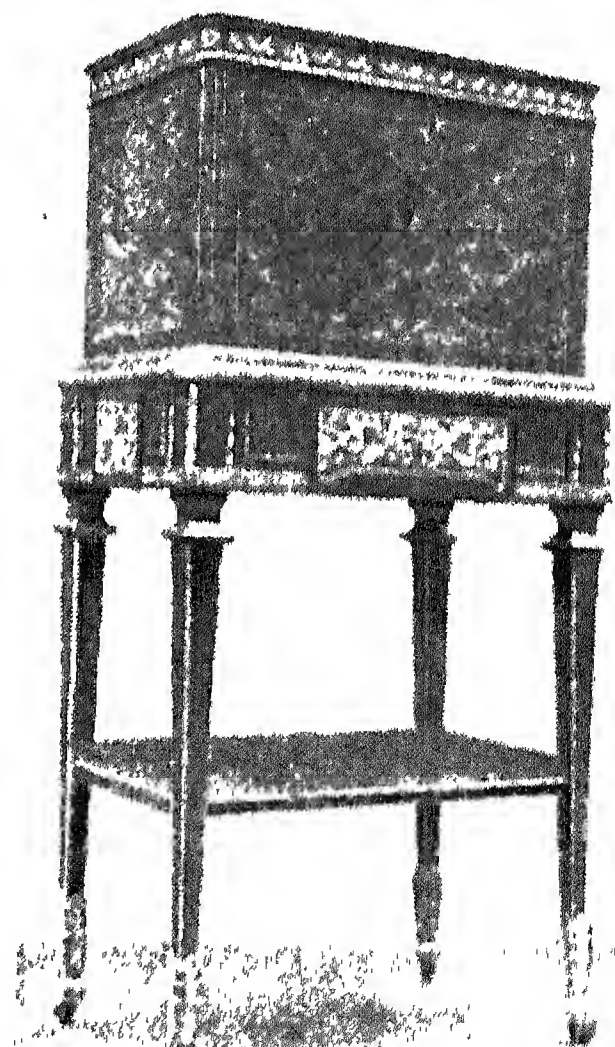
Loulan. Ancient town and kingdom in Chinese Turkistan (now Sinkiang prov., China), also called Shanshan. Situated on the caravan route between China and the Roman Orient, the region embraced the classical Issedon Serica. Destroyed by desert encroachment, Loulan was identified by Hedin in 1901 in the heart of the Lop desert. Stein's expeditions in 1907 and 1914 revealed human and cultural remains of primitive alpine roundheads, besides fine brocaded silks of the Han dynasty, 1st century B.C., and iron implements which had been used by immigrant traders of higher culture.

Loulé. Town of Portugal, in the prov. of Faro. It stands on a mountain slope 201 m. by rly. S.S.B. of Lisbon and 10 m. N.N.W. of Faro, and is encompassed by ruined Moorish walls, with a citadel overlooking the little stream of Loulé. It manufactures porcelain, leather goods, and articles made from the palm, agave, and esparto grass. Pop. (1950) 50,953.

Louny. Town and dist. in the Bohemian portion of Czecho-Slovakia. Situated on the river Chelb, 64 m. by rly. N.E. of Prague, it has iron and sugar refining industries.

Louping III.

Disease of sheep. A form of chorea or paralysis, it is known in some districts as trembling. It appears to be due to a germ which the animals pick up when feeding. There is no cure for the disease, which is at its worst in spring and autumn, and an animal once infected dies.



Louis Style. 1. Ebony commode in the shape of a marriage chest, with marquetry of metal in tortoiseshell, Louis XIV period. 2. Commode, with overlaid marquetry of mahogany, and heavily mounted with chased ormolu; probably by Caffieri, Louis XV period. 3. Jewel cabinet and stand, Louis XVI period.

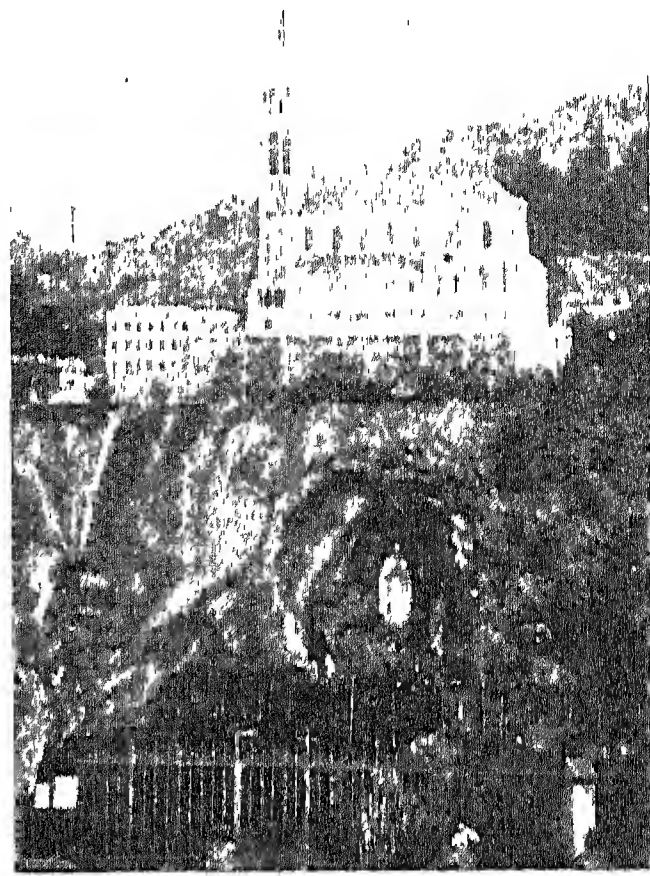
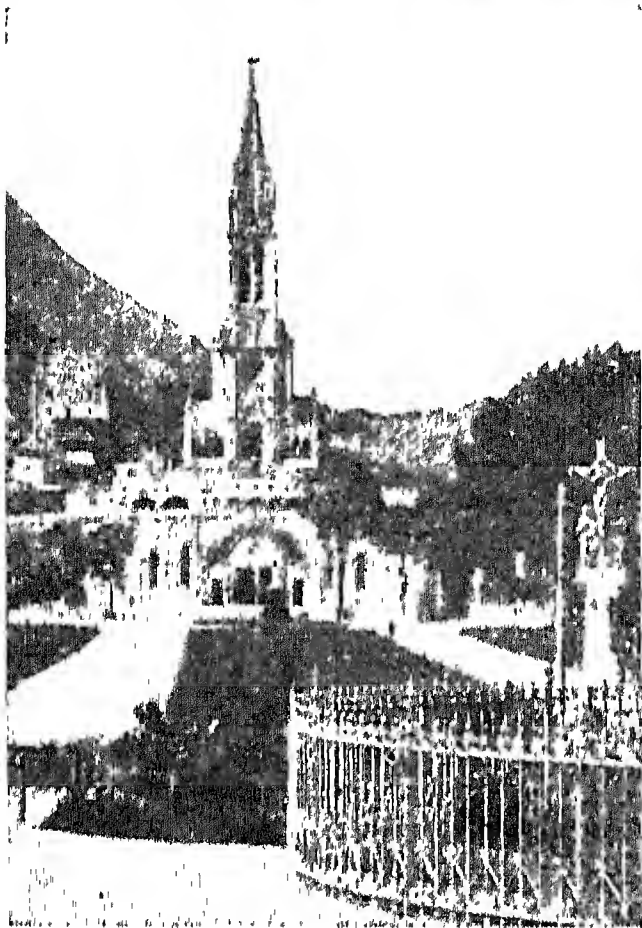
1. Wallace Collection; 2 and 3, Jones Bequest, V and A. Museum

Lourdes. Town of France, in the dept. of Hautes-Pyrénées. It lies in hilly country on the Gave de Pau, 12 m. by rly. S.S.W. of Tarbes. Except for some local quarrying and agricultural trade, the town relies almost entirely on the constant stream of pilgrims to the grotto of Our Lady of Lourdes. The basilica, 1876, and the church of the Rosary, 1889, are close by the shrine, as also is the large Hospice de Notre Dame des Douleurs. The old château of Lourdes stands on an eminence overlooking the right bank of the river. The treaty of Brétigny, 1360, gave Lourdes to the English, who held it until 1406. Pop. (1954) 15,829.

The famous pilgrimage arose from the alleged appearances of the Virgin Mary to a poor peasant girl named Bernadette Soubirous (1844-79) in 1858. The shrine, erected in the small grotto, where Bernadette saw the Virgin, and the healing spring close by, soon attracted large numbers of pilgrims seeking cures, and many apparently well-authenticated recoveries have been recorded. Pilgrimages are organized from all parts of France and from other countries, chiefly during the summer months, when the town is thronged with pilgrims, many of them cripples, and scenes of extraordinary excitement are witnessed. A conservative estimate of the number of pilgrims in a normal year is well over 500,000. The great novel by Émile Zola, entitled *Lourdes*, published 1894, is a rational account of happenings during a pilgrimage. See Bernadette.

Laurenço Marques or LORENZO MARQUES. Seaport of Mozambique. Situated on the harbour of Delagoa Bay, one of the finest natural harbours in the world, the city is the terminus of railways to the Transvaal, from which it derives the bulk of its transport trade, and Rhodesia. The aerodrome, 3½ m. from the city, is a port of call for airliners from Europe. The rly. station is considered the finest in S. Africa. A new road to Durban (425 m.) was opened 1934. There are a R.C. cathedral, Anglican and Methodist churches, a synagogue, a mosque and a Chinese temple, a botanic garden, and municipal bus services. Pop. 70,000.

Louse (plural lice). Name given to a group of small wingless insects, parasitic on birds and mammals. They form the order Anoplura (286 British species). Lice lay their eggs on the hair or feathers, and the mouth parts are



Lourdes, France. Left, the basilica, in front of which is the Chapel of the Rosary. Right, the miraculous grotto and basilica

developed into a hooked tube, with which they bore into the skin and suck the blood of their hosts. The eggs hatch out in a few days, and reproduce their species in about a fortnight. Hence the rate of reproduction is rapid. The biting-lice or bird-lice (*mallophaga*) live chiefly on birds. The true-lice or sucking-lice (*siphunculata*) are confined to mammals. The human louse (*Pediculus humanus*) exists in two races: the head louse (*capitis*) and the body louse (*corporis*). The last-named is the chief agent in the spread of epidemic typhus fever. Other lice-born diseases are a form of relapsing fever and trench fever.

Lousewort (*Pedicularis sylvestris*). Perennial herb of the family Scrophulariaceae, native of Europe. It has a short rootstock and branching leafy stems a few inches high. The narrow oblong leaves are deeply cut into segments from the sides. The tubular two-lipped flowers are rose-coloured. The name is due to an ancient



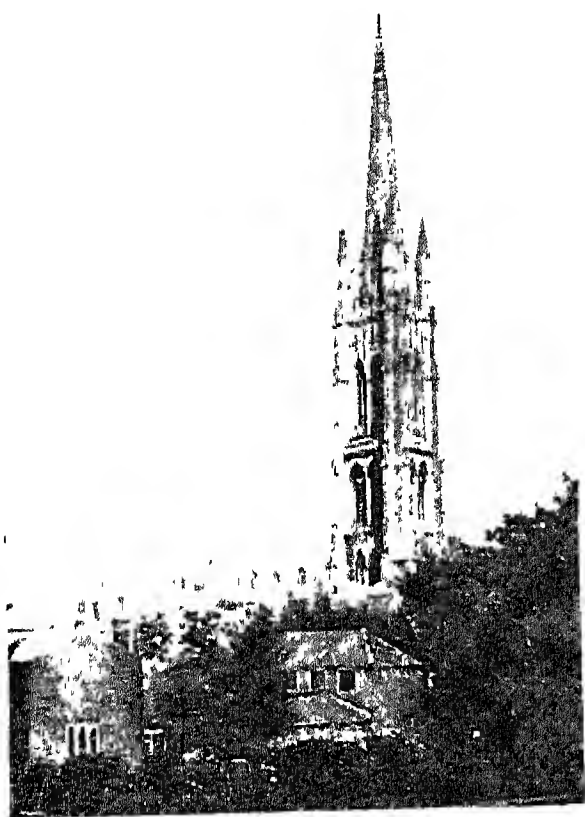
Lousewort. Foliage and flower-head of this parasitic herb

idea that the plant when eaten by sheep made them lousy. It is a parasite upon the roots of other plants. Another species, the marsh lousewort (*P. palustris*), which is an annual, grows in bogs.

Louth. Co. of the Irish Republic, smallest in the country. In the prov. of Leinster, it has an area of 317 sq. m. The coastline on the Irish Sea is broken by Carlingford Lough, Dundalk Bay, and the estuary of the Boyne. The chief rivers are the Fane, Lagan, Glyde, and Dee, while the Boyne flows along the S. boundary. The surface is flat, save in the N.E., where are the Carlingford mts., and the S.W. Chief industries are agriculture, for which there is much fertile land, on which oats, barley, potatoes, and flax are grown; and fishing, including the culture of oysters. The co.'s principal towns are Dundalk, the county town, Drogheda, and Ardee. Carlingford and Greenore are holiday resorts. Three members are elected to the dail.

Originally part of Orgial, or Argial, Louth became a county in the 13th century, being for many years part of Ulster. It has remains of several monasteries as well as some pre-Christian buildings, the most noted being at Monasterboice. Louth, from which the county takes its name, is a village 5½ m. from Dundalk. Once a flourishing place called Knockfergus, it had a monastery, said to have been founded by S. Patrick. Pop. (1951) county, 68,747; town 5,292.

Louth. Bor. and market town of Lindsey, Lincs, England. It stands on the Ludd, 26 m. N.E. of



Louth, Lincs. Parish church of S. James, with steeple 300 ft. high

Lincoln, with a rly. station. A canal, dating from 1761-63, connects it with the Humber. The chief building is the large and beautiful church of S. James, a Perpendicular edifice, notable for its spire and rebuilt in the 15th century. Louth, the trading centre for a large agricultural area, has works for making



Louth borough arms

agricultural implements and malting establishments. Alfred Tennyson and his brothers were educated at the grammar school. Near the town, at Louth Park, are the remains of a Cistercian abbey, founded about 1140.

With a market dating from Anglo-Saxon times, Louth was prosperous in the Middle Ages, when there was a trade in wool here. The town, incorporated in 1551, received a charter in 1834. It gives its name to a county constituency. In 1920, floods, after a cloudburst, killed 20, and did enormous damage. Market days, Wed., Fri. Pop. (1951) 11,128.

Louvain (Flemish Leuven). Town of Belgium, in the prov. of Brabant. It lies on the river Dyle, 19 m. by rly. E.N.E. of Brussels, and is an important rly junction. The town was surrounded by remains of old fortifications, later turned into promenades; outside this circle lay the manoeuvre ground, the 16th cent. château of Héverlé, and the Abbaye de Parc, a Premonstratensian house of note. The chief industries are brewing, lace making, printing, and tobacco manufacture. Pop. (est. 1955) 34,200.

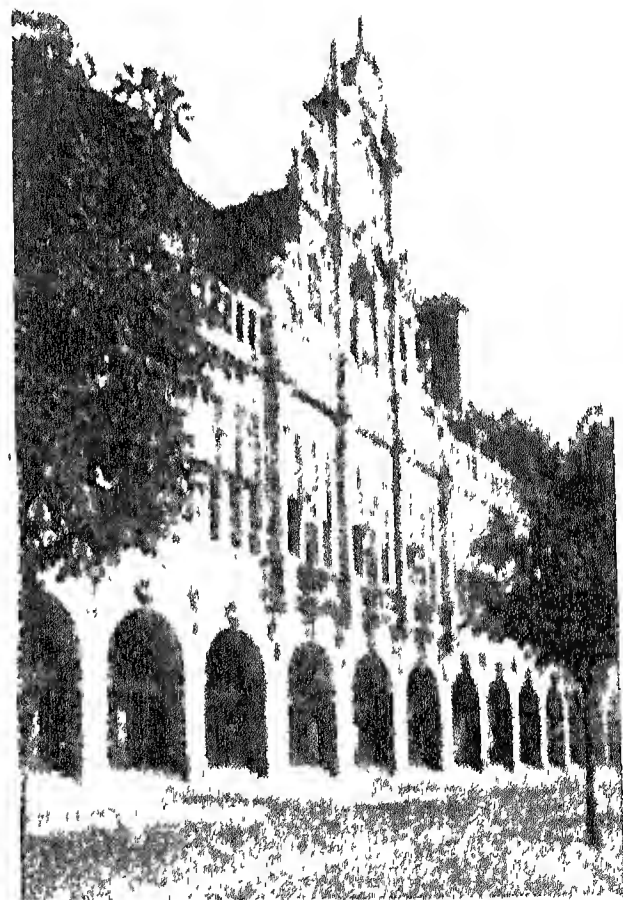
The hôtel de ville, one of Belgium's finest buildings, a late Gothic work begun in 1448-69, with a profusion of sculptured ornament, escaped damage during the destruction of Aug., 1914. The neighbouring church of S. Pierre, of the same period, was less fortunate. The famous university of Louvain is the intellectual centre of Belgian Catholicism, and has five faculties with various technical and agricultural schools affiliated. Founded in 1426, it was counted the leading university of Europe in the 16th century. Suppressed by the French, 1797, and secularised by the Dutch, 1817, it was revived as a R.C. institution 1834.

Louvain itself dates from 891, was capital of the dukes of Brabant, and one of the wealthy cloth centres of the Low Countries in medieval times, when its pop. numbered about 120,000. Its decay began with the ruthless suppression, by Duke Wenceslas in 1382, of a townsmen's revolt, which led to the migration of many weavers.

In the First Great War, German troops entered Louvain, Aug. 19, 1914. A week later, on the pretext that Belgian civilians had shot at German soldiers, they began an orgy of massacre and terrorism. Whole streets of houses were set on fire and the inhabitants shot down as they tried to escape. Townsfolk were deported to German prisons, some being forced to march until they dropped, when they were mercilessly shot or

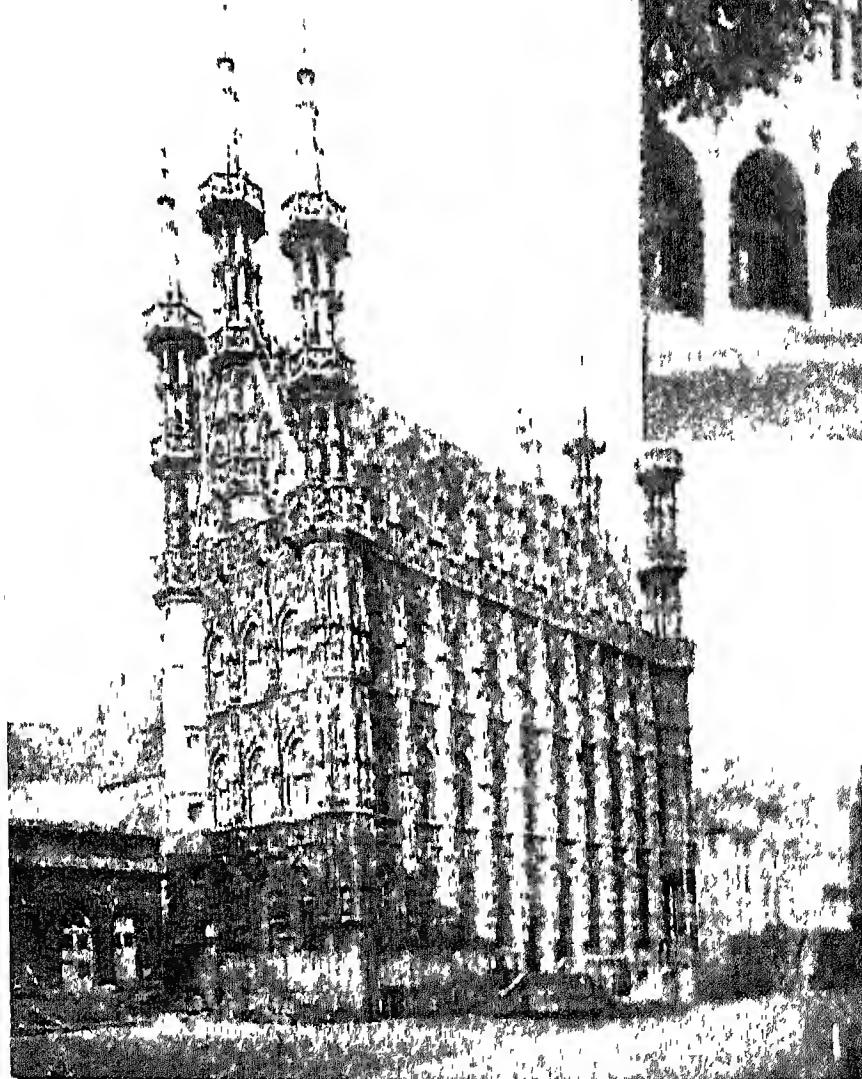
bayoneted. The town was methodically sacked and burned from Aug. 27 until Sept. 2; many of its public buildings were destroyed, including the church of S. Pierre and the university library, with its priceless treasures. Cardinal Mercier stated that 176 persons had been shot or burned to death. That this outbreak of barbarity was part of a deliberate plan to subdue the Belgian populace was shown by a letter found by the French in 1919, written by the Kaiser, William II, to the Austrian emperor.

When the Germans invaded Belgium in 1940, British forces which had come to the aid of the Belgian armies occupied a line on the river Dyle, having Louvain as its centre. The town was heavily shelled and bombed, and the university library, rebuilt with American help after the First Great War, was again destroyed. The Grenadier Guards put up a magnificent stand at Louvain, but the Germans took the town on May 17, the Guards retiring on Fumes. On Sept. 4, 1944, British troops occupied Louvain



against negligible resistance, strategically valuable bridges across the Dyle being secured undamaged with the help of members of the Belgian resistance movement.

Louviers. Town of France. In the dept. of Eure, it is the chief town of an arrondissement. It lies on the river Eure, 16 m. by rly. S.S.E. of Rouen, and is a railway



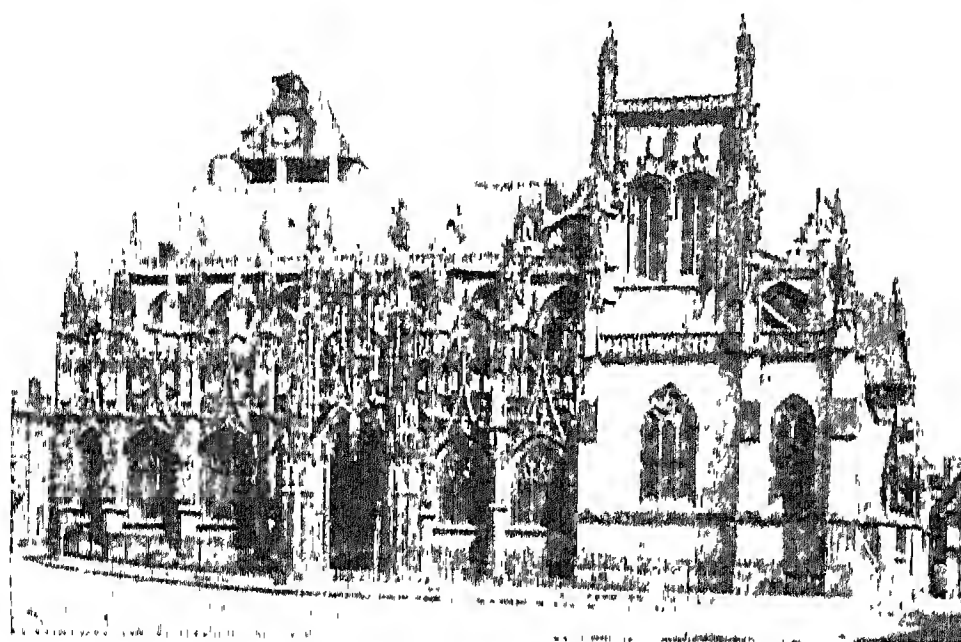
Louvain, Belgium. 1. Fifteenth cent. town hall. 2. The university library which replaced the historic building sacked in Aug., 1914, and was itself destroyed in May, 1940

junction. It has made cloth from medieval times, and there are some smaller industries. Its Gothic church of Notre Dame, with a fine S. portal of the 15th century, is noteworthy. Pop. (1954) 10,746.

Louvois, FRANÇOIS MICHEL LE TELLIER, MARQUIS OF (1641-91). French statesman.

Born in Paris, Jan. 18, 1641, the son of Michel le Tellier, he was trained for public life and soon attracted the attention of Louis XIV. In 1666 he became minister of war in succession to his father, and rapidly brought the French army to a high state of efficiency. This was proved when war broke out in 1672, and during the next 18 years Louvois was one of the directors of the policy of France, both military and civil. He succeeded Colbert as the king's chief adviser, but had lost some of his influence when he died suddenly, July 16, 1691.

Louvre, THE. Old palace of the kings of France, in Paris, now containing a great museum of art and antiquities. Situated on the right bank of the Seine, the building, with its courts, occupies an area of about 7 acres. It has been suggested that it was originally a meeting-place of wolf-hunters, whence the name (*louverie*, from *loup*, wolf). The first official mention of the Louvre by its name occurs in 1204, in the reign of Philip

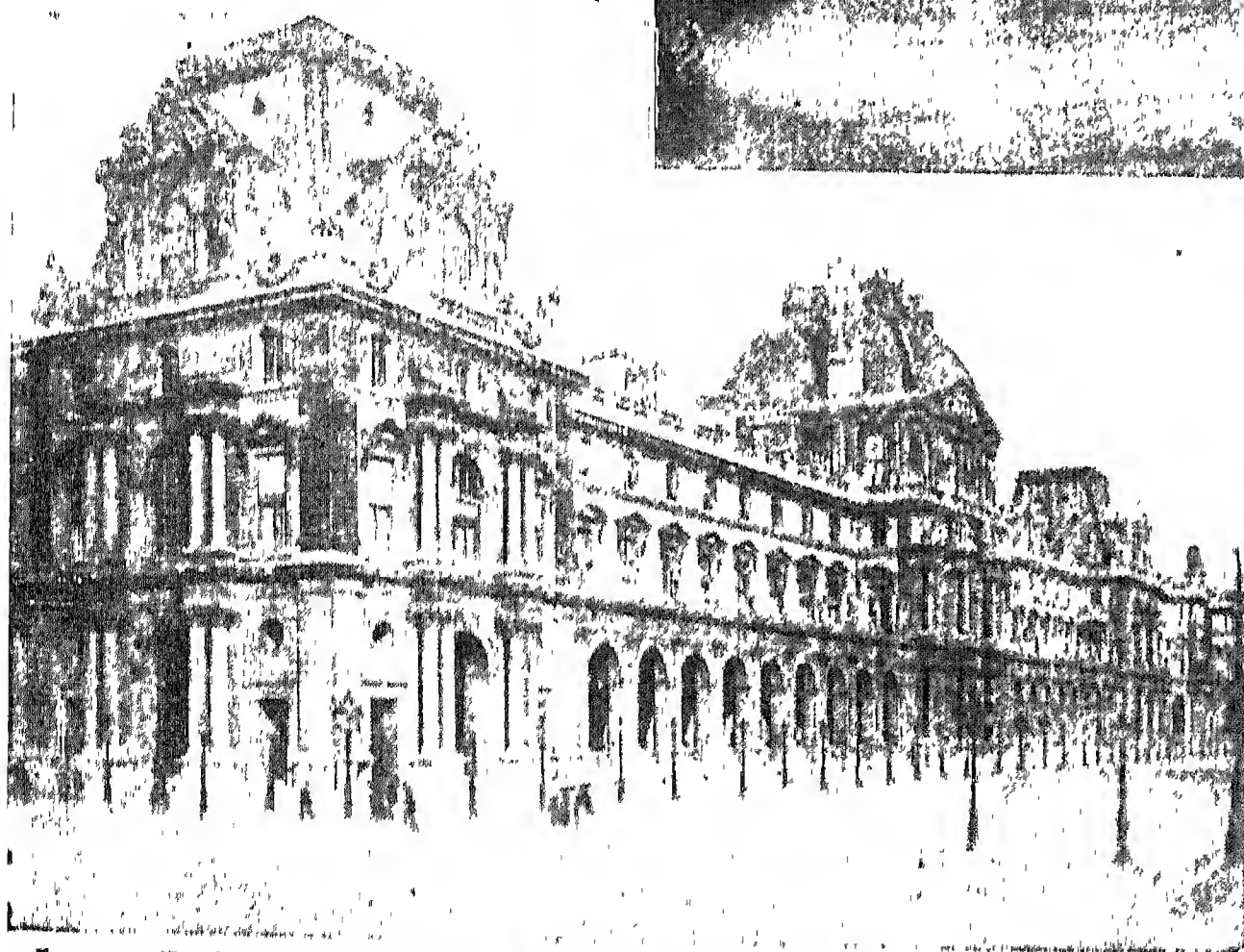
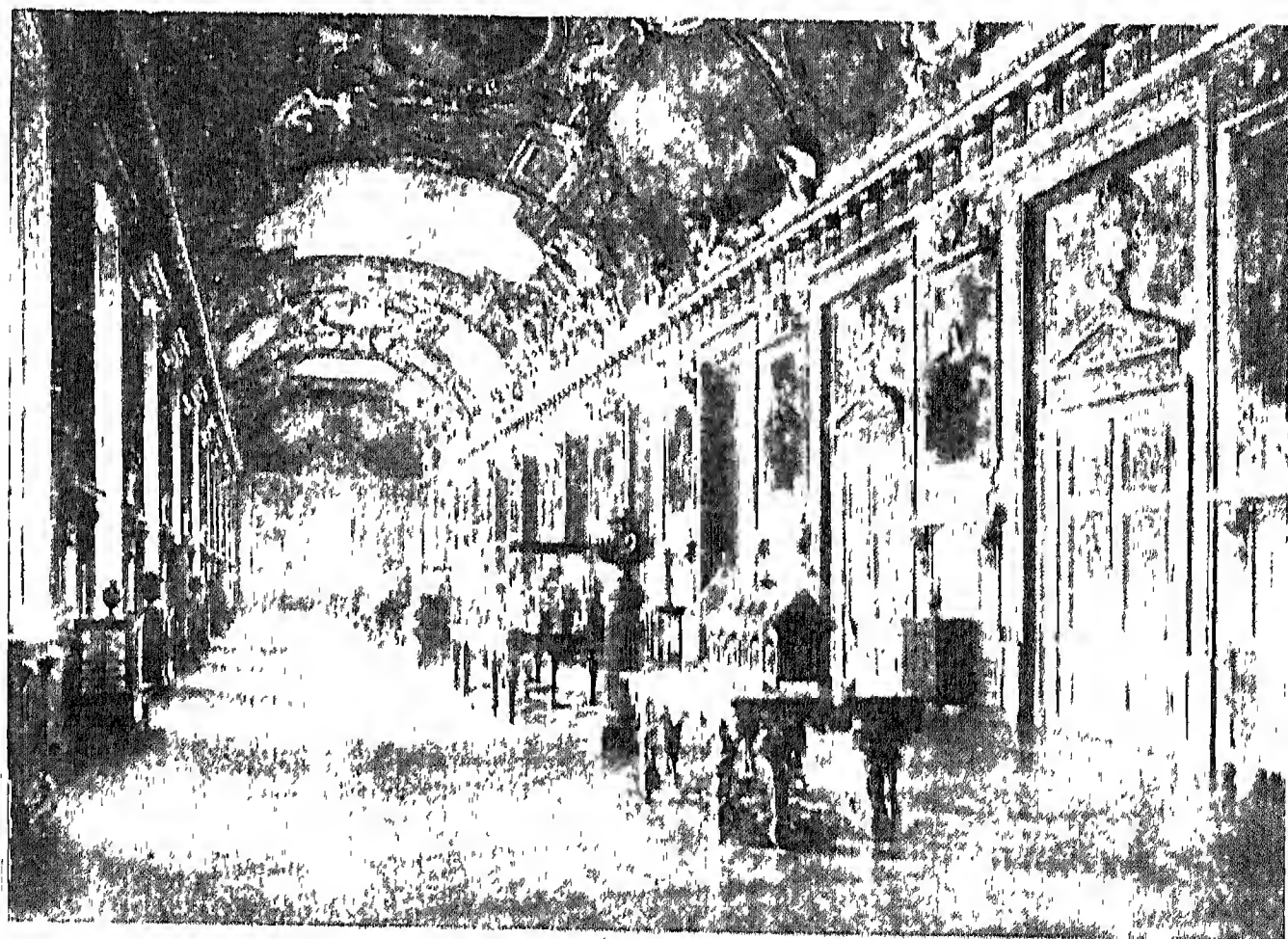


Louviers, France. Gothic church of Notre Dame

Augustus; but probably a fortified palace existed on the site two or three centuries earlier. While Philip Augustus may be considered as the originator of the Louvre, the monarch responsible for the beginnings of the present building was Francis I, before whose reign the palace had been abandoned as a royal residence for many years.

Francis, having pulled down the old tower and introduced modern improvements, afterwards reconstructed it on a new plan, first with the assistance of the Italian architect Serlio and afterwards with that of Pierre Lescot. The parts designed by Lescot rank among the masterpieces of Renaissance architecture. During the latter half of the 16th cent. numerous additions and improvements were made.

Meanwhile the adjacent palace of the Tuileries (*q.v.*) had been built, and Henry IV revived an old idea of connecting the Tuileries and the Louvre so as to form one great group of buildings. A long gallery had actually been begun in 1566 with this intention; the structure was completed about 1608. In 1624 notable alterations were made to the Louvre. Lemercier, instructed by Richelieu to prepare plans for the completion of the palace, pulled down the whole of the N. wing and built what is now



Louvre, Paris. North palace of the New Louvre, 1852-57, from the Place du Carrousel. Top, right, Apollo Gallery, decorated by Le Brun in 1681, and rebuilt 1845-51, with ceiling paintings by E. Delacroix

known as the *pavillon de l'Horloge*. The magnificent Apollo Gallery dates from Louis XIV's reign. Further alterations were made by Perrault, and the building, unfinished at the Revolution, was completed during the Second Empire.

Napoleon I, who added another gallery, filled the galleries with a priceless collection of works of art which he brought back with him from conquered foreign capitals. Although much of this loot was subsequently restored, the collection remains one of the finest in the world. Its sculpture includes the Winged Victory of Samothrace and the Venus of Milo, and among the galaxy of world-famous pictures here are Raphael's Holy Family, Leonardo's Virgin of the Rocks,

the Mona Lisa, and other Italian masterpieces, and an unrivalled collection of the French school.

The Salle Rubens, filled with the series of allegorical paintings executed for Catherine de' Medici; the Salle Van Dyck; the Salon Carré, which contains the greatest masterpieces of various schools; and the Grande Galerie are among the more famous of the Louvre's many galleries. During the Second Great War 800 of its treasures were hidden at Valency castle on the Loire. *See* Architecture; Art; Paris; *consult* The Art of the Louvre, M. K. Potter, 1905; Le Palais du Louvre, G. Geffroy, 1909.

Louvre OR LOUVER. Term in architecture applied to a small turret raised above the aperture in the roof of a medieval hall (*q.v.*), to allow the smoke to escape and to prevent the rain from entering. The sides were often covered with overlapping boards with spaces between them. Hence boards or slips of glass arranged in this way are termed louvres or louvre-boards. *See* Chimney; Lantern.

Lovage (*Ligusticum scoticum*). Perennial herb of the family Umbelliferae. It is a native of N.



Lovage. Foliage and flower spray. Inset, flower-head and single flower

Europe, N. Asia, and N. America. It has a stout branched rootstock and large, much divided leaves. The erect, grooved stem is two or three feet high, the branches bearing umbels of small white or pink flowers. The root is aromatic, and the leaves are used as a pot-herb.

Lovat, BARON. Scottish title borne by the family of Fraser with an interval since about 1458. Hugh Fraser, who was made a lord of parliament, took the title of Lord Lovat, or Lord Fraser of Lovat, this being the name of his seat in Inverness-shire. The title passed from one descendant to another, until it came to Simon Lovat (*v.i.*), the Jacobite. When he was executed in 1747 his titles and estates

were forfeited, but the estates were restored to his son Simon, who raised the Fraser Highlanders. His direct heirs became extinct in 1815. In 1837, a kinsman, Thomas Alexander Fraser, a descendant of the 2nd baron, was created Baron Lovat.

His descendant, Simon Joseph (1871-1933), became the 16th baron. He raised Lovat's Scouts, commanded them in the S. African War, and on his return raised two yeomanry regiments which formed part of the Highland Mounted Brigade. In the First Great



16th Baron Lovat, British soldier
Russell

War he served in Gallipoli, France, and Flanders, later devoting himself to the forestry corps. He was parliamentary under-secretary for the dominions, 1927-28, and chairman of the Oversea Settlement League. On his death, Feb. 18, 1933, the title passed to his son, Simon Christopher Joseph Fraser (b. July 9, 1911), 17th Baron. He served in Commandos in the Second Great War, won the D.S.O., and reached the rank of brigadier. He was under-secretary of state for Foreign Affairs in the Churchill "caretaker" govt., May-July, 1945. Lord Lovat's seat is Beaufort Castle, Beaulieu, Inverness-shire. *Prose* Luvvut. *See* Fraser.

Lovat, SIMON FRASER, 12TH BARON (c. 1667-1747). Scottish Jacobite. Son of Thomas Fraser, of Beaufort, and grandson of the 7th baron, he was educated at Aberdeen. He was a strange mixture of a barbarous chieftain and an accomplished gentleman. Disappointed in an arrangement to marry his cousin, an heiress, he planned to seize her by force, but captured her widowed mother instead, and compelled her to marry him in 1696. This outrage brought such vigorous punitive measures down upon him that in 1698 he was found guilty of high treason and sentenced to death. For some years he was a fugitive in the northern Highlands, succeeding to the title in 1699.



Simon Fraser, Lord Lovat
Portrait by Hogarth, Nat. Port. Gallery

In 1701 he secured a pardon from William III for his political offences, but, failing to obey a summons to appear before the high court to answer for his outrage on the dowager Lady Lovat, he was declared an outlaw. His subsequent career is one continuous story of intrigue and treachery, a considerable part of his time being spent in French, Scottish, and English prisons. At one time he is said to have been a Jesuit preacher. He forsook the Jacobite cause in 1715, but turned to it again. Joining the Young Pretender in 1745, he was captured after Culloden and executed in London, April 9, 1747.

Lovat's Scouts. This British regiment, raised by the 16th Lord Lovat (*q.v.*), has been incorporated in the Scottish Horse (*q.v.*).

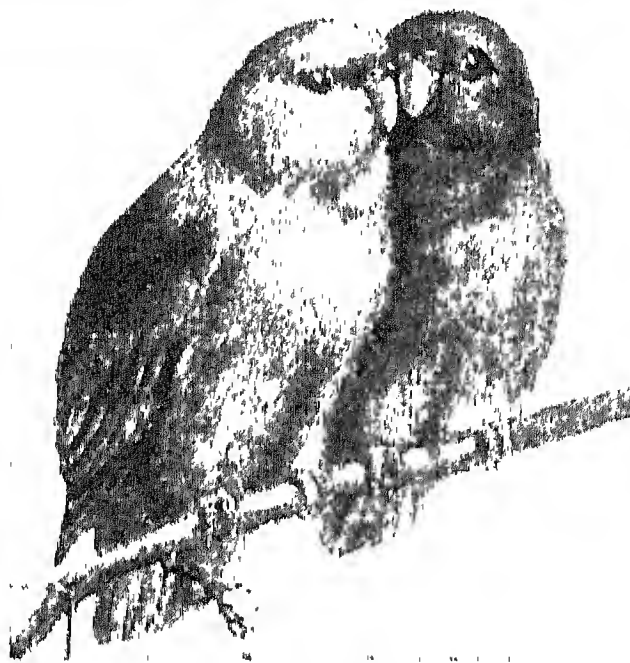
Love. Passionate or emotional sense of attraction felt by one person towards another, or in an extended sense towards an impersonal object. Based on a universal instinct, and therefore found among lower animals in a rudimentary state, notably in the forms of sexual and parental affection, love in man becomes a complex emotion, comprising moral and spiritual elements, tending to become disinterested or to identify the happiness of the lover with that of the loved. The awakening of sexual love is normally accompanied by a great widening of sympathy and of the emotional and intellectual horizon. Through Christianity and the European conception of chivalry the ideal of sexual love has been clarified and raised to a higher level than in antiquity or in the East today. The age of the troubadours, though not without its extravagances, marked an advance. Dante's Vita Nuova is the classic of medieval love. As expressions of modern feeling may be mentioned the poetry of Shelley, especially Epipsychidion, E. B. Browning's Sonnets from the Portuguese, D. G. Rossetti's House of Life, Meredith's Modern Love, and much of Yeats.

The conception of love has a prominent place in many religious and philosophic systems. Empedocles found the two fundamental forces of the universe in love and strife—the principles of attraction and repulsion. To Plato, in the Symposium and elsewhere, *eros* or passionate, sensuous love is at once a shadow of and a preparation for the love of the soul for the eternal ideas of the good and beautiful. Like seeks like, and

the soul, being itself an idea or immaterial substance, seeks union with ideal beauty. The thought of a loving relation between man and God was alien to classical antiquity, though found in various Eastern religions. Thus, in many forms of Hinduism salvation is sought in a passionate or ecstatic devotion to Krishna or Siva, a belief which, though often degraded, was expressed by some teachers in the loftiest language. Similar doctrines form a leading part of the mystical poetry of the Persian Sufis.

The Hebrew prophets, by developing the idea of mutual love, as of a husband and wife, between Jehovah and Israel, led up to Christianity. In the Wisdom literature the personified Thought of God loves those who love her (Prov. 8, v. 17). In the N.T. love is the fulfilling of the law, *i.e.* love to God and man is the one essential motive of right action. Its nature is described in 1 Cor. 13 by St. Paul, after whom in Christian ethics love ranks as the chief of the triad of virtues. Pantheistic thought adopts the idea of love as the mainspring of the universe, as in Shelley, while to Spinoza the highest function of the soul is the intellectual love of God, *i.e.* the enthusiastic conviction that one's own good is identical with the will of the world-soul.

Love Bird. Name popularly given to a small parrot of the genus *Agapornis*. The idea of mutual affection conveyed by the name is quite without foundation, the birds perching close together merely for the sake of warmth. Solitary love birds do not pine; and the fact that the death of one of a pair is sometimes followed by that of the other merely indicates that both were in ill-health. Their handsome appearance and pretty ways make them favourites for the aviary, but they are apt



Love Bird. Grey-headed variety of Madagascar

to prove delicate. The rosy-faced love bird is the hardiest, and will often breed in captivity, if provided with a roomy and suitable aviary. There are about nine species of this genus of parrots, all natives of Africa and Madagascar. They fly in flocks, feed on berries and seeds, and have the habit of taking possession of the nests of other birds instead of building for themselves.

Lovedale. Mission station near Alice, Cape Province, S. Africa. It was founded in 1841 by the Free Church of Scotland, and was long under the care of Dr. James Stewart, to whom there is a monument on Sandil's Kop. The school gives technical and other instruction to about 700 pupils.

Love Feast. Alternative term for the common meal taken weekly by members of the early Christian Church (2 Peter 2; Jude 12). It is also called *Agapē* (*q.v.*).

Love for Love. Comedy by William Congreve (*q.v.*). It was first produced April 30, 1695, when Betterton took the part of Valentine Legend, and Mrs. Foresight and Mrs. Frail were played respectively by Mrs. Bracegirdle and by Mrs. Barry. With its scintillating wit and shrewd character-drawing, it is undoubtedly Congreve's masterpiece, and is by many critics considered the best English comedy of manners. Its coarseness, though sometimes obtrusive, is characteristic of its period. A bowdlerised version was produced in 1871 without arousing much enthusiasm. Later revivals in its original form include: Aldwych Theatre (Stage Society), 1917; Sadler's Wells, 1934; Phoenix and Haymarket Theatres (John Gielgud company), 1943-44.

Love-in-a-Mist (*Nigella damascena*). Annual herb of the family Ranunculaceae, a native of S. Europe. The alternate leaves are

divided into thread-like segments, and the large blue or white flowers are surrounded by the divided bracts—the "mist" of the name. It is also called devil-in-the-bush and fennel-flower. Another species (*N. hispanica*), also much grown in gardens, has deep blue flowers and crimson stamens, but lacks the "mist."

Love-in-Idleness. Popular name for the pansy or heartsease. See Pansy.

Lovelace, RICHARD (1618-58). English cavalier and poet. Eldest son of Sir William Lovelace of Woolwich, who was killed in the Low Countries, he was educated at Charterhouse and Gloucester Hall, Oxford. For presenting to the Long Parliament the petition of Kentish royalists on behalf of Charles I, he was imprisoned in the Gatehouse, Westminster, where he wrote his *Stone Walls do not a Prison Make*, 1642. He took up arms for Charles in 1645, and fought for the French king against Spain, 1646. On his return to England he was again, 1648, cast in prison, at Petre House, Aldersgate, where he prepared for the press his *Lucasta: Epodes, Sonnets, Songs, etc.*, published 1649. The original of *Lucasta* is said to have been Lucy Sacheverell, who was affianced to him, but married after hearing a false report of his death at Dunkirk. Lovelace, one of the handsomest men of his day and of high character, after spending his estate in behalf of the royal cause, died a pauper in Gunpowder Alley, Shoe Lane, and was buried in old St. Bride's Church, Fleet Street. He is best remembered by his lyrics, *To Lucasta: On Going to the Wars*; and *To Althea from Prison*. His poems were edited by W. C. Hazlitt, 1864, new ed. 1901.



Richard Lovelace, English poet

Love-lies-Bleeding (*Amarantus caudatus*). Annual herb of the family Amaranthaceae. A native of India, it has alternate undivided leaves, and minute dark crimson flowers, clustered like catkins.

Lovelock, JOHN EDWARD (1910-49). New Zealand athlete. He was born at Temuka, New Zealand, and after attending Timaru high school and Otago University he became a Rhodes scholar at Exeter College, Oxford, in 1931. Later he studied medicine at St. Mary's hospital, London. In 1932



Love-in-a-Mist. Spray of foliage and flowers; right, fruit and bracts

he set up a British mile record of 4 min. 12 sec., and in the following year ran his world's record mile of



Jack Lovelock,
New Zealand athlete

4 min. 7.6 sec. at Princeton, New Jersey. In the Berlin Olympic Games of 1936 Jack Lovelock won the 1,500 metres in the Olympic record time of 3 min. 47.8 sec. After serving in the Second Great War in the R.A.M.C. and A.P.T.C., in 1947 he took a post in Manhattan hospital, New York. He was killed when he fell in front of an underground train at Brooklyn, Dec. 28, 1949.

Lover, SAMUEL (1797-1868). Irish novelist and song writer. Born in Dublin, Feb. 24, 1797, he was by turns miniaturist, song writer, novelist, and dramatist. Secretary of the Royal Hibernian Academy, 1830, he became a member in 1836. He helped to found the Dublin University Magazine, 1835, and was associated with Dickens in the establishment of Bentley's Miscellany, 1837. He had to abandon painting in 1844 through failing eyesight. He gave recitals which he called Irish evenings, in London, Canada, and the U.S.A., 1846-48; was pensioned in 1856 and, dying at St. Helier, Jersey, July 6, 1868, was buried at Kensal Green. He published Handy Andy, 1842; L.S.D., afterwards called Treasure Trove, and He Would Be a Gentleman, 1844; and the well-remembered ballads Rory O'More, The Low-backed Car, The Four-Leaved Shamrock, Molly Bawn, Widow Machree, etc. He wrote music for his songs and sang them with excellent effect.

Love's Labour's Lost. Romantic comedy by Shakespeare, his first play. The princess of France and her three ladies, Rosaline, Maria, and Katharine, frustrate the attempt by Ferdinand, king of Navarre, and Biron (or Berowne), Longaville, and Dumaine, his chief courtiers, to keep the court as an academy from which all women were to be excluded for three years. In Don Armado, a fantastical Spaniard; Sir Nathaniel, a curate;

and Holofernes, a schoolmaster, euphuism and pedantry are good-humouredly satirised. The scene is laid in Navarre.

Written about 1592, at the same time as some of the Sonnets, with which it has points in common, this play was first printed in a revised form in 1598. The text contains passages which combine the early draft and the revision. Its plot is original, but the author was influenced by Lyly's Euphues, 1580, the same writer's comedies, 1580-92, and by contemporary events, particularly in France. The play, which is remarkable for its lyrics, notably the song, When daisies pied, was mentioned by Meres in 1598.

Loving Cup (Lat. *poculum caritatis*). Large cup filled with wine or punch, and passed from hand to hand at state banquets, civic feasts, and university gatherings to pledge health. The formal procedure is for the diner who drinks to stand to receive the cup from the diner on his right, to pledge the one on his left, and to remain standing to guard the latter's rear until he has in turn passed the cup.

A form of the old wassail bowl, it is sometimes called the grace cup, and it is said that Margaret Atheling, wife of Malcolm Canmore, in order to induce the Scots to remain at table for the grace after meat, filled a cup of this kind with choice wine, of which each guest was allowed to drink as much as he liked after grace had been said.

The custom by which all present drank from one cup was observed at the ancient Jewish paschal supper; and was long usual at communion in the Christian Church.

Low, ARCHIBALD MONTGOMERY (1888-1956). British scientist. Born at Broughty Ferry, Dundee, and educated at St. Paul's School and the Imperial College, London, he specialised in electrical engineering. The photography of sound and the development of radio apparatus owe much to Low. He also invented a radio-control gear

for torpedoes, the vibrometer, and the audiometer. For the non-technical reader he published over 50 books, e.g. Science in the Home; Romance of Transport; Science in Industry. He died at Chiswick, London, Sept. 13, 1956.

Low, DAVID (b. 1891). British cartoonist. Born at Dunedin, New Zealand, April 7, 1891, he was a cartoonist to several journals in his own country and Australia. In 1919 he joined the Star in London and soon became known for witty political caricatures. He was, 1927-50, the political cartoonist of the London Evening Standard, in which his work became world famous, especially his reactionary Colonel Blimp, originated 1934. Low worked for the Daily Herald 1930-53, then joined the Manchester Guardian. His books included Cartoon History of Our Times, 1939; Years of Wrath, 1946; Low's Company, 1952; and an autobiography, 1956. See p. 1771.



David Low,
British cartoonist

Low, SIR SIDNEY JAMES MARK (1857-1932). A British author and journalist. Born in London, Jan. 22, 1857, he was educated at King's College School and Balliol College, Oxford, and was called to the bar at the Inner Temple, 1892. He edited the St. James's Gazette, 1888-97, and was afterwards associated with the Standard. An authority on imperial questions, Low was made lecturer on imperial and colonial history at King's College, London. He was an alderman of the L.C.C., 1901-05, and was knighted in 1918. His books include The Governance of England, 1901; Political History of England, 1837-1901, 1907. Low died Jan. 13, 1932.

Low Archipelago. Series of islands in the Pacific Ocean, lat. (approx.) 20° S., long. (approx.) 150° W., called by the natives Paumotu and Tuamotu. It includes the Gambier Islands, Clermont-Tonnerre, Kusaie, etc.; most are coralline, many of them being atolls. They yield pearls and copra. Most of them belong to France.

Low Countries. Name given to an area forming the Netherlands and Belgium; and sometimes including Luxemburg.

Lowe, SIR HUDSON (1769-1844). British soldier. He was born at Galway, July 28, 1769, the son of



Samuel Lover,
Irish novelist



Loving Cup presented by Samuel Pepys to the Clothworkers' Company of London

a military surgeon. He joined the army in 1787, serving with distinction against the French, especially during the Egyptian campaign of 1801. A good linguist, he did much valuable work in S. Europe, and for two years was governor of the Ionian Islands. During 1813-14



Sir Hudson Lowe,
British soldier

he was sent on missions and served with the Russian and German armies. In 1815 he was appointed custodian of Napoleon at St. Helena. His duties brought upon him much odium and misrepresentation, but he seems to have acted conscientiously in a difficult position. He died Jan. 10, 1844. *Consult* Sir H. Lowe and Napoleon, R. C. Seaton, 1898.

Lowell. City of Massachusetts, U.S.A., one of the two co. seats of Middlesex co. At the junction of the Merrimac and Concord rivers, 26 m. N.W. of Boston, it is served by rlys. and an airport. Its buildings include a city hall, textile school, a state normal school, and the memorial building. An important industrial city, Lowell obtains power chiefly from the Merrimac. Its textile industry, modelled on English methods, made the city in the 19th century the nation's greatest producer of cotton goods. Founded in 1822, Lowell was incorporated in 1826 and became a city in 1836. Population, 101,389.

Lowell, ABBOTT LAWRENCE (1856-1943). American historian. Born Dec. 13 1856, at Boston, a brother of Percival Lowell, he was educated at Harvard and Berlin. He studied law and was a practising barrister, 1880-97, but his real interests were in the problems of government, and in 1896 he made an international reputation by his *Government and Parties in Continental Europe*, written from a new point of view, that of an American observer. In 1897 he became lecturer and in 1900 professor of the science of government at Harvard, and in 1909 president of that university. He retired in 1933, and died Jan. 6, 1943. He wrote *Essays on Government*, 1889; *The Government of England*, 1908; *Public Opinion and Popular Government*, 1913.

Lowell, AMY (1874-1925). An American poet. Sister of Percival and Abbott Lowell, she was born at Brookline, Mass., Feb. 9, 1874.

Her poetry, in which free verse was united with vivid and unconventional imagery, belonged to the Imagist school, of which she was the avowed head. Her publications included *A Dome of Many Coloured Glass*, 1912; *Men, Women, and Ghosts*, 1916; *Legends*, 1921; *East Wind*, 1926; *Ballads for Sale*, 1929. She produced a biography of Keats, 1905. She died May 12, 1925. Selected Poems, ed. J. L. Lowes, appeared in 1928.

Lowell, JAMES RUSSELL (1819-91). American poet, essayist, and diplomatist. He was born at Elmwood, Cambridge, Mass., Feb. 22, 1819, son of the Rev. Charles Lowell, pastor of the Unitarian West Church. He was of Puritan descent; his paternal grandfather in 1780 introduced into the Bill of Rights, a clause abolishing slavery in Massachusetts; an ancestor on his mother's side was Sir Patrick Spens of the famous ballad. After graduating at Harvard, 1838, he studied law and began practice in Boston, but abandoned law for literature. He became editor of *The Pennsylvania Freeman*, in which he took the side of the abolitionists; lectured on poetry



J. R. Lowell,
American writer

at the Lowell Institute, Boston, 1854-55; was professor of belles lettres at Harvard, 1855-77; edited *The Atlantic Monthly*, 1857-61; and, with C. E. Norton, *The North American Review*, 1864-72. He was U.S. minister in Madrid, 1877-80; and in London, 1880-85. In 1841 he married Maria White (1821-53), herself a poet and a writer against slavery, who profoundly influenced his outlook; and in 1857 Frances Dunlap (d. 1885). He passed several summers in England, 1886-89, and died at Elmwood, Aug. 12, 1891.

As America's representative in London, Lowell displayed a tactful firmness that did not hinder his material influence on the improvement of the relations between the two English-speaking peoples. His literary life displayed versatility of genius and was marked by high achievement. It is recorded that he was hushed to sleep as a child by the reading of Spenser's *Faerie Queene*. His first volume, *A Years' Life and other Poems*, appeared in 1841; his last, *Heart-ease and Rue*, in 1888. His gift

for satirical humour was revealed in the poems in Yankee dialect which began in *The Boston Courier* in 1846, as the work of one Hosea Biglow. Inspired by opposition to the Mexican war, they were published as *The Biglow Papers* in 1848.

His *Fable for Critics*, published anonymously, a rhyming review of contemporary American literature in which vivacity is combined with critical insight, and the beautifully lyrical *Vision of Sir Launfal*, an excursion into Arthurian legend, also belong to 1848. The second series of *The Biglow Papers*, prompted by the Civil War, began in *The Atlantic Monthly*, 1862, and were collected, 1867. In addition to *The Vision of Sir Launfal*, Lowell's best poetry includes *The Present Crisis*, 1845; Ode recited at the Harvard Commemoration, July 21, 1865; *The Cathedral (Chartres)*, 1870; *Agassiz*, 1874; *Three Memorial Poems*, 1877; and a number of nature poems, sonnets and simple but touching lyrics.

Lowell's prose works, cultured, graceful, brilliant, suggestive, but full of learned allusions and appealing on the whole to the select few, include *Fireside Travels*, 1864; *My Study Windows*, 1871; *Among My Books*, 1870-76, containing his notable essay on Dante; *Democracy and Other Addresses*, 1887; *Political Essays*, 1888; *A Life of Hawthorne*, 1890; *The Old English Dramatists*, 1892; *Latest Literary Essays*, 1892; *Impressions of Spain*, 1900. He edited the works of several English poets and wrote an introduction to an edition of Walton's *Compleat Angler*, 1889.

Bibliography. Writings of J. R. L., Riverside ed., 11 vols., 1899; *The Poet and the Man*, F. H. Underwood, 1893; *Letters*, ed. C. E. Norton, 3 vols., 1894; *J. R. L. and His Friends*, E. E. Hale, 1899; *J. R. Lowell*, H. E. Scudder, 1901; *Life and Work*, F. Greenstreet, 1905; *Bibliography*, G. W. Cooke, 1906; and *His Poetry*, W. H. Hudson, 1912; *L. as a Critic*, J. J. Reilly, 1915; *New Letters*, ed. M. A. de W. Howe, 1934.

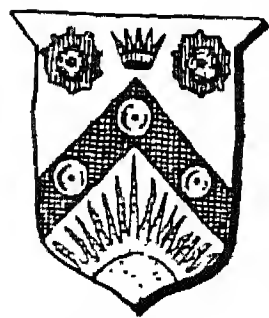
Lowell, PERCIVAL (1855-1916). American astronomer. Born March 13, 1855, in Boston, he was educated there and at Harvard. After some years in Japan and Korea, he devoted his energies to the erection of the Lowell Observatory at Flagstaff, Ariz., and the prosecution of researches there. In 1902 he was made non-resident professor of astronomy at the Massachusetts institute of technology. He devoted

himself especially to researches on planetary markings and believed himself to have confirmed and enlarged Schiaparelli's discovery of canals on Mars, for which he was awarded the Janssen medal of the French astronomical society in 1904. The ill-defined markings on Mercury and Venus were submitted by him to an equally searching scrutiny. He wrote *Mars*, 1895; *The Solar System*, 1903; *Mars and its Canals*, 1906; *Mars as the Abode of Life*, 1908; and volumes on the Far East. He died Nov. 12, 1916. See *Mars*.

Lower Deck. The principal gun deck in sailing ships of war, and frequently so called. Below it were the orlop deck and cockpits, and above it, in the order given, the middle, main, and upper decks. In modern warships almost the whole armament is mounted on the upper deck, and in the First Great War ships with lower deck guns, such as *Good Hope* and *Monmouth*, often found them practically useless, as they were too close to the water. The forward part of the lower deck was formerly used for the messing and berthing of the ship's company, whence the petty officers and men of the navy are referred to collectively as the lower deck.

Lower Saxony (Ger. *Niedersachsen*). Land of W. Germany, formed 1946 from Hanover, Oldenburg, and Brunswick (*qq.v.*), with the city of Hanover as its capital. In 1956 it had an est. pop. of 6,541,150, of whom 2,110,800 were refugees and expelled persons.

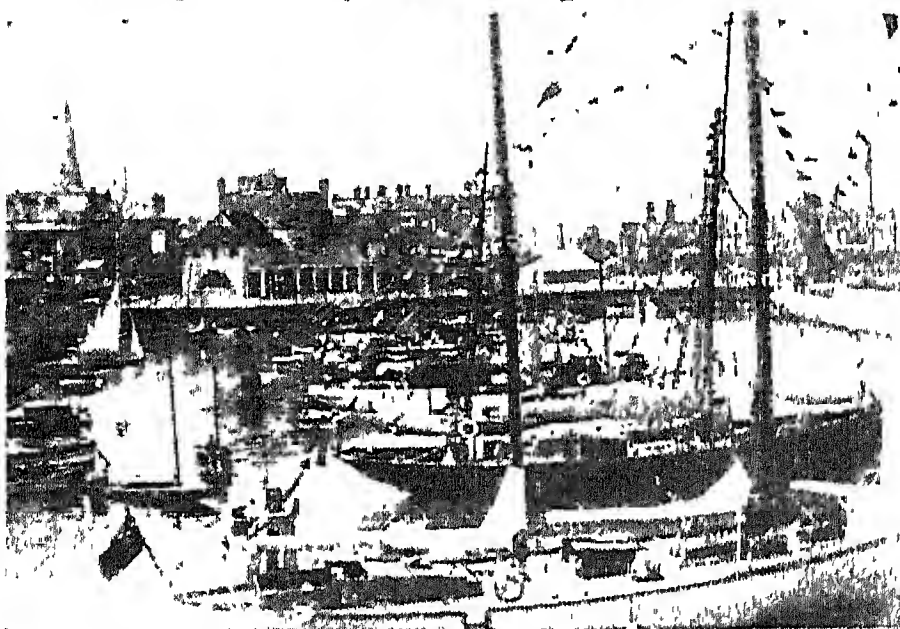
Lowestoft. Bor., seaport, and resort of Suffolk, England. It stands at the mouth of the Waveney, 10 m. S. of Great Yarmouth, and includes Oulton Broad, with which and with the Waveney the harbour is linked by lock gates. The chief church



Lowestoft arms

is S. Margaret's, a Perpendicular building. Esplanades, piers, firm sands, and the nearby Broads are among its holiday attractions. The old town is on high ground; the narrow streets and steps leading down to the sea are called scores. There are an inner and an outer

harbour, and large fish quays and markets. Lowestoft Ness is the most easterly point of England. Lowestoft originated as a fishing port, but soon obtained the right to hold markets and fairs, and in 1885 became a borough. Market day, Wed. Pop. (1951) 42,837.



The battle of Lowestoft is the name given to the naval engagement between the English fleet under James, duke of York, and a Dutch one, June 3, 1665. War had broken out in March. When the rival fleets met off Lowestoft, an obstinate battle took place, ending in the flight of the Dutch vessels, after the flagship of their admiral Opdam had been blown up.

A naval base during the First Great War, Lowestoft was bombarded by the Germans from the sea and bombed from the air. On April 25, 1916, and again on Nov. 26, 1916, it was attacked by German warships. On July 26, 1918, a German submarine operating off the town sank two smacks and took the crews on board. Lowestoft also suffered from German air raids in the Second Great War.

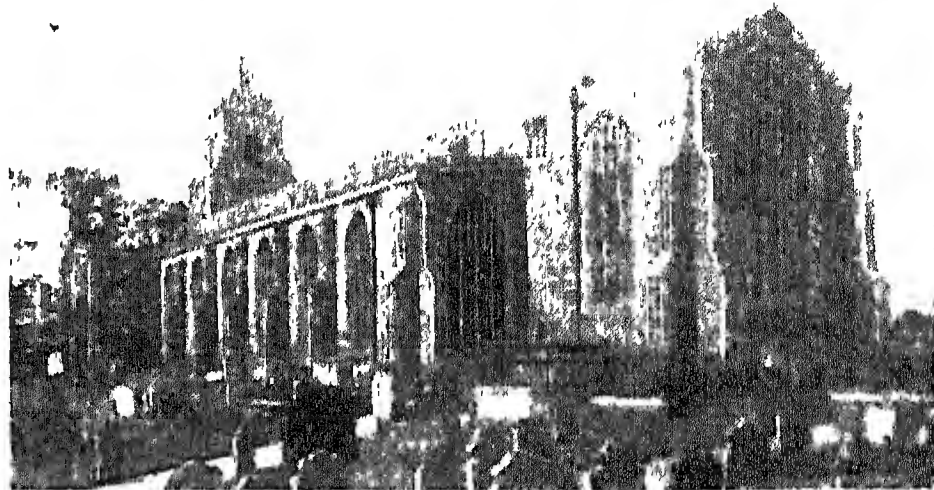
Lowestoft. Name of a hard paste china made at Lowestoft, England, 1775-1802. It has a good body and an Oriental character, with decorations in blue and white. Polychrome was used for scenery and figure painting. An earlier soft paste porcelain and an earthenware were made from 1756 onwards.



Lowestoft. Specimens of the china-ware formerly made at Lowestoft. From Herbert Allen collection, Victoria and Albert Museum

Lowicz. Town of Poland. In the co. of Warsaw, it stands on the Bzura, a tributary of the Vistula, 45 m. S.W. of Warsaw, and on the Warsaw-Berlin rly. There were soap, candle, oil, and vinegar factories and tanneries, and trade was done in corn, leather, and horses. The neighbourhood had flour mills and sugar factories. In the 14th cent. it was the capital of a principality.

Lowland. Stretch of country which is, on the whole, low or level, especially if compared with neighbouring regions. Thus the Lowlands of Scotland comprise the region between the northern highlands and the southern uplands. Great Britain, S.E. of a line joining the mouths of the Tees and Exe rivers, is also a great lowland,



Lowestoft, Suffolk. S. Margaret's parish church. Top, left, yachts in the Basin decorated for a regatta

for the hills which cross it rarely attain an elevation of 1,000 ft. Lowlands are much more suitable for settlement than highlands, and in temperate latitudes concentrate the most important modern commercial activities. See *Highland*; *Plain*.

Lowland Regiment. Former British army unit. Formed at Edinburgh in Dec., 1910, it provided primary training for volunteers and national service men preparatory to their being drafted into one of the Scottish Lowland regiments. It was disbanded in July, 1943, when its functions were transferred to the newly formed General Service Corps.

Low Latin. Name generally given to the Latin in use from A.D. 600 to 1500, sometimes used to include the Latin of the period 175-600, which, however, is more commonly called Late Latin. It is chiefly characterised by extensive borrowing from Greek.

Teutonic, and Oriental languages, and neglect of grammatical rules. *See* Latin Language.

Lowndes, MARIE ADELAIDE RENÉE BELLOC (1868–1947). British writer. Daughter of Louis Belloc, French barrister, and sister of Hilaire Belloc (*q.v.*), she was educated in England and in 1896 married F. S. A. Lowndes. Her first novel was *The Heart of Penelope*, in 1904; her second, *Barbara Rebell*, 1905, made her reputation as a writer of distinction. Her later novels were often more sensational. *The Lodger*, 1913 (based on the mystery of Jack the Ripper), was translated into many languages, sold some million copies, and was also successful as a film. Well remembered were *What Really Happened*, 1926; *The House by the Sea*, 1937; *Lizzie Borden*, 1940. Her best work was contained in reminiscences: *I too Have Lived in Arcadia*, 1941; *Where Love and Friendship Dwelt*, 1943; *The Merry Wives of Westminster*, 1946; *A Passing World*, 1948 (posth.). She died Nov. 14, 1947.



Mrs. Belloc Lowndes, British novelist
Hoppe

Lowndes, WILLIAM THOMAS (c. 1798–1843). British bibliographer. The son of a London publisher, he devoted 14 years to compiling a *Bibliographer's Manual*, which, modelled on Brunet's *Manuel du Libraire*, appeared in four vols., Jan. 1, 1834. During 1839–43 he issued several parts of *The British Librarian*, but his laborious and unremunerative drudgery reduced him to poverty of health and pocket. He died July 31, 1843. H. G. Bohn (*q.v.*), having acquired the copyright of the *Manual* from W. Pickering, brought out a new and revised edition 1857–64. The first work of its kind in English, it is still a useful guide to English literature down to the middle of the 19th century.

Low Sunday. Name given to the first Sunday after Easter. According to some authorities it was so called because it is a kind of second or lower celebration of the great feast, and it was once a custom to repeat some of the paschal solemnities on this day. Others suggest a corruption of *Laud Sunday*, *laudes*, i.e. praises, being the first word of the sequence (*q.v.*) for the day. Yet another suggestion is a corruption of *Close Sunday*. The

French call the day *Pâques closes* (Lat. *Pascha clausum*), or close of Easter; the Greek Church uses the term New Sunday, in reference to the new life entered upon by the newly baptized. In old times the day was called *Dominica in albis*, or the Lord's Day in albs, or white garments, those who had been baptized on Easter Eve wearing their chrismos, or white robes, for the last time before these were deposited in the church.

Low Temperature Carbonisation. Term generally applied to the carbonisation of bituminous coal of medium or weakly caking type, or of brown coal or lignite, at temps. up to 600° C. (1,110° F.) in retorts constructed of metal or of firebrick. The main object in carbonising coal at low temps. is to produce easily combustible smokeless fuel (low temp. coke) for use instead of coal in open domestic fires. In addition to coke, which is the chief product, gas, tar, and ammoniacal liquor are also obtained. The burning of raw coal entails the loss of valuable by-products, recovered in the production of low temp. coke, as well as polluting the atmosphere.

Carbonisation of the charge of coal can be effected either by heating the retorts externally by means of gas (coal gas, water gas, or

oven coke, and can be burned in all types of domestic fireplace.

The coal gas produced from bituminous coal in externally heated retorts is of high calorific value—800 to 900 B.Th.U. per cu. ft.—and contains high proportions of unsaturated hydrocarbons (ethylene, propylene, butylene) and saturated hydrocarbons (methane, ethane, propane) as compared with town's gas produced by high temp. carbonisation. The gas produced in internally heated retorts is mixed with the burned gases used for carbonising the charge. It is in consequence appreciably lower in calorific value—180 to 230 B.Th.U. per cu. ft.—than the gas from externally heated retorts, the calorific value depending on the vol. of burned gases used to effect carbonisation. In one type of internally heated retort the coal is carbonised by steam heated to 550° C. (1,020° F.) and gas is produced similar in composition to that obtained in externally heated retorts.

Low temp. tars differ appreciably in physical and chemical properties from tars produced in gasworks retorts and coke ovens at high temp.—1,350° C. (2,460° F.). They contain higher homologues of the compounds present in high temp. tars. They also contain

	Low temp. carbonisation		High temp. carbonisation
	External heating	Internal heating	External heating
Yields per ton of coal as charged			
Moisture in coal as charged p.c.	6–10	10–15	2–3
Coke, cwt.	13.5–15.5	8–12	13.5–14.5
Gas, cu. ft.	2,500–4,000	30,000–50,000	12,500–20,000
Gas, calorific value B.Th.U. per cu. ft.	800–900	180–230	450–500
Gas, therms.	22.5–32	69–90	70–90
Tar, gals.	18–22	16–18	10–14
Tar, s. g.	1.00–1.04	1.04–1.06	1.00–1.12

producer gas) burned in chambers surrounding the retorts, or internally by means of hot combustion gases passed through the charge of coal. In the latter case the heating gases can be (a) produced by the combustion of a portion of the coal gas made in the process, (b) produced when air is passed through the charge, (c) generated in a separate plant. Many different designs of retorts have been used for the process; in some the charge of coal is stationary, in others in motion, during treatment.

The coke produced, owing to its physical structure and its relatively high volatile matter content, ignites easily, is more combustible than gasworks or coke-

higher proportions of paraffinic and phenolic compounds with appreciably lower proportions of pitch and free carbon. The liquor produced contains only a small quantity of ammonium compounds and is not commercially useful.

The yields of products vary considerably according to the type of plant used. Typical yields from externally and internally heated retorts are shown in the table, together with the yields obtained by high temp. carbonisation.

D. MacDougall

Lowther, JAMES (1840–1904). British politician. Born Dec. 1, 1840, he was educated at Westminster School and Trinity College, Cambridge, and called to the

bar in 1864. He entered parliament as Conservative M.P. for York in 1865. Between 1867 and 1880 he held office as parliamentary secretary to the poor law board, under-secretary for the colonies, and chief secretary for Ireland. After eight years' absence from the house he sat for Thanet from 1888, a Tory "diehard" but a popular member, dying Sept. 12, 1904.

Lowther, JAMES WILLIAM. Speaker of the British house of commons, 1905-21, who became Viscount Ullswater (*q.v.*).

Lowther Arcade. A covered avenue formerly connecting the Strand with Adelaide Street, London, W.C. Designed 1830-32 by Witherdon Young, and named after a chief commissioner of woods and forests, it was 245 ft. long, had a domed glass roof, and held shops for the sale of toys and fancy goods. Its site has been occupied since 1904 by Coutts's Bank.

Lowther Hills OR LEADHILLS. Range of hills in Scotland. They are on the borders of Lanarkshire and Dumfriesshire. Green Lowther (2,403 ft.) and Lowther Hill (2,377 ft.) are the loftiest summits.

Loy, MYRNA (b. 1905). American film actress. Her surname was Williams, and she was born of Scottish-Welsh stock at Helena, Mo., Aug. 2, 1905. She studied dancing with Ruth St. Denis, and entered films in 1925. In early pictures she usually played the part of an adventuress, but in 1934 became famous by her brilliant performance with William Powell in *The Thin Man*, a picture which led to a series of "comedy thrillers." She went back to drama in *The Rains Came*, 1940. Bachelor Knight was shown in 1947.

Loyal Regiment. Regiment of the British army and the only unit to incorporate "Loyal" in its



Loyal Regiment badge

title. The 1st battalion was raised in Scotland in 1740 as the 47th Foot and saw active service in the Jacobite rebellion of 1745. Drafted to Nova Scotia in 1758, it served at the siege of Louisburg and was known as Wolfe's Own. At Quebec (1759) it was in the centre of the thin British line which broke up the French attack. From Canada, the 47th went to America and, after fighting at Bunker Hill, was part of the British force that surrendered at Saratoga. It received the title The Lancashire

Regiment, 1782, and served under Wellington throughout the Peninsular War. It was in the Burmese war, 1825-26, the Crimea, and the Afghan war, 1878-79.

In 1793 the present 2nd battalion of the Loyal Regiment was raised as the 81st Foot and called the Loyal Lincoln Volunteers. It first saw service in the Kaffir war, 1800, and then served in the Peninsula, fighting under Moore at Corunna. It served with distinction at Waterloo and in Afghanistan, 1878-79. The 47th and 81st Foot were linked in 1881, to form the 1st and 2nd battalions of the Loyal North Lancashire Regiment, which distinguished itself in the relief of Kimberley.

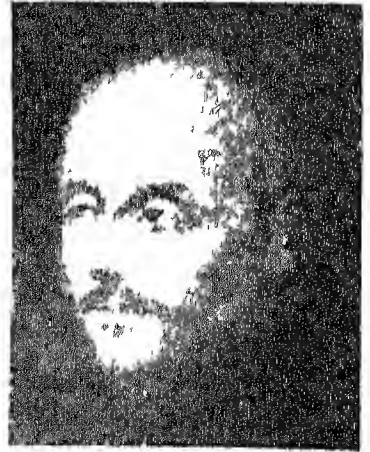
Twenty-one battalions of the Loyals were raised for the First Great War and gained the battle honours: Mons; Aisne, 1914, '18; Ypres, 1914, '17, '18; Somme, 1916, '18; Lys; Hindenburg Line; Suvla; Gaza; Bagdad; and Kilima-Njaro. In 1920 the regiment's title was altered to Loyal Regiment (North Lancashire). During the Second Great War there were eleven regular and territorial battalions at home and overseas. The 1st was in France (1939-40), Africa, and Italy; the 2nd and 5th were captured at Singapore; the 10th served throughout the Italy campaign; the 6th, a reconnaissance regiment with the 2nd div. in Burma, earned distinction at Kohima; and the 7th acted as an A.A. unit in N.W. Europe (1944-45). The regimental depot is at Preston.

Loyalties. Drama by John Galsworthy. Ronald Dancy, an army officer, is accused by Ferdinand de Levis, a wealthy Jew, of stealing money from him at a house party. Some of those who know Dancy believe he may be guilty—as indeed he is—and the play traces the conflicts of loyalties, to relative, friend, profession, club, race, and to truth and justice, which beset them. *Loyalties* was first performed at the St. Martin's Theatre, London, March 8, 1922.

Loyalty. A group of French islands in the Pacific Ocean, approx. 60 m. E. of New Caledonia. Lifou, Mare, and Uvea are the largest islands. Bananas and coconuts are cultivated, sandalwood, copra, and rubber are exported. The people, mostly Roman Catholics, are of mixed Polynesian and Melanesian descent. The group has been French since 1864, and forms one of the dependencies of New Caledonia. Area, 800 sq. m.

Loyola, S. IGNATIUS OF (1491-1556). Founder of the Society of Jesus. He was the son of Don Beltran Y. de

Oñez y Loyola and Marina Saenz de Licona y Balda (Lopez de Recalde is an error), and was born in the Basque prov. of Guipuzcoa. In youth Loyola was in contact with the court circle of



S. Ignatius of Loyola, founder of the Society of Jesus. Painted by Sanchez Coello, Madrid.

Ferdinand and Isabella; he was talented, ambitious, and dissipated. In 1517 he became a soldier and in 1521 defended Pampeluna gallantly against the French that when a cannon ball tore one of his legs and shattered the other the garrison surrendered. He asked for romances as distraction, about heroes he might imitate; only lives of saints were found; he day-dreamed alternately about rivaling these, and about chivalry and ideal ladies.

Suddenly he saw the futility of this; he went on a pilgrimage to Montserrat and made his knight's vigil before Our Lady and hung up his arms there. During 10 months of fierce penance and scruples in a cave at Manresa and of sickness in hospitals, he made notes which finally became his booklet, *Spiritual Exercises*. He voyaged amid incredible hardships to Jerusalem meaning to stay there, but was sent back wondering what to do. At least he must be educated, so he gave 11 years to this, beginning with Latin among schoolboys at Barcelona, then philosophy and theology at Alcalá, Salamanca, and Paris, harassed by attacks on his orthodoxy and reforming zeal and, in his destitution, begging alms as far as Flanders and England. Friends deserted him, until in 1534 with six others (to whom he later added a further three) he vowed poverty and chastity. They simply placed themselves at the pope's disposal, meanwhile serving in hospitals and preaching.

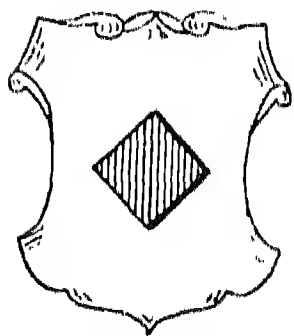
In 1537 Ignatius was ordained and went to Rome, calling his group the company (a military term) of Jesus. Jesuit, a word never used by Ignatius, had long been a sneering nickname for men who cantingly repeated the holy Name. Like the name Christian, from a term of scorn it became normal

and respectful. These men gradually saw they needed a minimum rule of life: the first formula was approved in 1540, but the company (of which Ignatius became the first general) was at first limited to 60 members. The earliest text of *Spiritual Exercises* belongs to 1541; its solemn approbation to 1548. It is a method by which a man, reviewing in solitude the great truths of religion and the example of Christ, may seriously choose how best to spend his life. Ignatius made rules reluctantly, desiring the maximum of spontaneity together with discipline among his men; his Constitutions received their final touches only after his death. He had no specific aim other than liberty to work at whatever the needs of the Church might indicate: hence he abandoned any special dress, the singing of choir, dangerous honours, and obligations proper to ecclesiastical high rank: all his additions, which included service of the plague-stricken, of the bashful poor, of prostitutes, and even educational (the Roman and German colleges and university work generally), were due to pressure of circumstances.

But the society grew rapidly, and sent missionaries everywhere; already in 1549 Francis Xavier was provincial of India. Before Ignatius died his firm paternal government was controlling 12 provinces. He was a man of intense prayer and complete self-abnegation; as calm as he was fearless; as wise as he was simple; grave, yet beloved. He died July 31, 1556. In 1622 he was canonised. The best biography is *The Origin of the Jesuits*, J. Brodrick, 1940. Consult also *Loyola's Testament*, Eng. trans. E. Rix, 1900. Pron. Lo-yo'-la. See Jesuits.

C. C. Martindale, S.J.

Lozenge. In heraldry, diamond-shaped charge, differing from the fusil (*q.v.*) in being broader. A lozenge may be pierced; if the hole is circular, the charge is called a rustre; if the hole is square, it is described as square pierced; if lozenge pierced, showing a narrow band, it is called a masele, and is supposed to represent a link of chain armour. A shield divided by diagonal lines from right to left, and crossed by diagonal lines from left to right, is said to be lozengy.



Lozenge in heraldry

The word is also used for a small tablet, often medicated, such as the familiar cough lozenge.

Lozère. Dept. of France. It is a mountainous area situated high up on the Central Plateau, N.W. of the Cévennes scarp. The Causses of the S.W., dry limestone areas, some over 3,000 ft. high, are a feature of the dept. The chief rivers are the Lot and the Tarn. The staple industries are the rearing of cattle and sheep, and the growing of cereals and fruit. Silk is produced. Cheese is made and bees are kept. Mende is the capital; Florac and Langogne are other towns. Before the Revolution the dept. was in the province of Languedoc. Area 1,996 sq. m. Pop. (1954) 82,391.

L.S.D. Symbol for pounds, shillings, pence. These are the initial letters respectively of the Latin librae, solidi, and denarii. As livre, sol (son), and denier, these terms were originally brought from France to England.

Lualaba. River of the Belgian Congo. One of the head-waters of the Congo, it rises near the S. borders of the Katanga prov., and flows generally N. to its confluence with the Lukuga. Its most important affluent is the Luapula, which unites with it to form what is generally spoken of as the Lualaba-Congo. The river is navigable for launches intermittently from Bukama, the terminus of the railway from Cape Town to Kongolo, and from Kindu to Ponthierville. The chief places on the banks are Bukama, Ankoro, Kabalo, the terminus of the rly. from Albertville on Lake Tanganyika, Kasongo, Kindu, Lova, and Ponthierville.

Luanda. See Loanda.

Luang Prabang. Town of Laos, Indo-China, the residence of the king. It stands at the confluence of the Mekong and Namkan 250 m. S.W. of Hanoi.

Luapula. River of Northern Rhodesia and the Belgian Congo. Forming part of the boundary between these countries, it issues from Lake Bangweulu, and flows N. through Lake Mweru, where it becomes the Luvua, and thence to the Congo. From Johnston Falls to Lake Mweru it is navigable.

Lubaantun. Ruins of Maya ceremonial centre near Punta Gorda in British Honduras. It belongs to the classic period (c. A.D. 300-900), and has notable pyramids, but no stelae or corbelled vaulted buildings.

Lubbock. City of Texas, U.S.A., and co. seat of Lubbock co. Situated 110 m. S. of Amarillo, it is served by the Atchison, Topeka, and Santa Fe rly. Originally a cattle town and now a centre of dairying and cotton growing and processing, it is also a commercial and financial centre. The Texas technological college occupies 2,000 acres, including an experimental farm. Lubbock was founded in 1891 when the communities of Monterey and Old Lubbock decided to pool their resources. Pop. (1950) 71,747.

Lübeck. City, former principality, and until 1945 free state of W. Germany. It is situated in Schleswig-Holstein near the mouth of the river Trave, which drains into Lübeck Bay, and is 38 m. N.E. of Hamburg, 145 m. N.W. of Berlin. Its name, of Wendic origin, means lovely one; in spite of the destruction of many of its remarkable medieval and 18th cent. buildings by bombing from the air in 1942, the city still deserves its name. Lübeck originated the northern form of Gothic architec-



Luang Prabang, Laos, Indo-China. Dancers and musicians at a performance in the open-air theatre.

ture, in which whole sections of the city were built in plain or glazed brick, with lofty spires or gabled fronts; and the inner town, on an island formed by the rivers Trave and Wakenitz and the Elbe-Trave canal, remains a show piece of medieval art. St. Mary's (1280-1304) was gutted during the Second Great War, and its 407-ft.-high twin spires were destroyed, but the vaulting remained and the church was re-roofed. The cathedral, founded 1173 by Henry the Lion and completed 13th to 14th

cents., with two towers nearly 400 ft. high, was damaged, but not beyond-repair; most of its treasures, including the altar painting by Hans Memlinc, were saved. S. Catherine's (14th cent.), which had been converted into a museum, escaped damage and was recon-verted into a church. S. James's (13th cent.) was undamaged, as was the remarkable Rathaus (1250 and later, an outstanding building of its kind), except for damage by fire to the interior of the great hall. The Holy Ghost hospital (13th cent.), the shipmen's guildhouse (16th cent.), and the monumental Holsten gate (1477) were all preserved. The Buddenbrook house (1758), setting of the most famous novel by Lübeck-born Thomas Mann, was destroyed, though its façade remained standing.

Chief Baltic Port

The former free state of Lübeck was 115 sq. m. in area, pop. (1935) 140,900, by 1949 increased by refugees from Russian-occupied Germany to 241,400. The city had in 1955 (est.) 228,770 inhabitants; the only other town of the state, the small port and resort of Travemünde, was incorporated with the city in 1915. Lübeck's economic importance derived from its old rôle as main port of the Baltic, and head of the Hanseatic League: a rôle it preserved until recently through its modern port facilities and the deep canal which permitted sea-going vessels to come right into the city. Before the Second Great War about 9,000 seagoing vessels entered the port annually; 3,000 inland vessels up to 7 ft. draught also reached it by the Elbe-Trave canal from Hamburg and the Elbe. Lübeck's own industries employed more than 50,000 workers and comprised blast furnaces, iron- and steelworks, engineering yards, shipbuilding, and the making of enamelware, furniture, wooden and earthen ware, food preserves, sweets, etc.

As a free port, Lübeck stocked timber, grain, ore, fertilisers, etc., and dealt with all the countries round the Baltic. Its marchpane and its liquors were famous.

Lübeck was founded in 1143 by Count Adolf of Holstein and, under Henry the Lion, about 1160 became an important settlement of Westphalian merchants; it came under the protection of the Holy Roman empire 1181, and, after a short Danish occupation, received the privileges of a free city 1226. German colonisation spread N. and E. from it; the Hanseatic league developed, and by the end of the

13th cent. Lübeck was its undisputed head, greatest seaport between Riga and Bruges and, under a patrician council, successful in home and foreign struggles. In 1530, however, a democratic opposition under Jurgen Wullenwever (*q.v.*) enforced Protestantism. Civic strife followed and, in 1535, led to a collapse from which neither the Hansa nor Lübeck recovered. Several wars, with Denmark, Sweden, etc., and in the 17th cent. the Thirty Years war, which left Sweden dominant in the Baltic, reduced Lübeck's importance still more. It recovered in the 18th cent. Taken by Napoleon, 1806, incorporated with France, 1810, and liberated, 1813, although now encircled by Danish territory, it regained its importance as a trade emporium. It joined the N. German confederation and customs union in 1868 and, under the empire as well as under the Weimar republic, preserved its republican constitution and its rights as a free city and port. It was governed by a diet of 80 and a senate of 11 under a burgomaster elected for two years; it had a particularly progressive system of education. During the Nazi regime it was subordinated, with Mecklenburg, to a *Reich Statthalter* whose seat was at Schwerin.

During the Second Great War the R.A.F. heavily attacked Lübeck, setting the port installations and U-boat building yards and parts of the city on fire, in the night of March 28-29, 1942. It was captured May 2, 1945, with very little fighting, by the British 11th armoured div., and came within the British zone of occupation.

Edgar Stern-Rubarth

Lübeck Bay. Inlet of the Baltic on the German coast. It runs in, as a continuation of Mecklenburg Bay, from N.E. to S.W., for a distance of 16 m., to the free state of Lübeck, between Holstein and Mecklenburg. The river Trave, which flows into it, has been deepened to afford connexion with the port of Lübeck, 14 m. inland, available for ocean-going steamships. It is sometimes called Neustadt Bay, from the port of that name on the Holstein coast.

Lubitsch, ERNST (1892-1947). German-American film director. Born in Berlin, Jan. 29, 1892, he entered the film world as a comic actor in 1913, and within a year had become a director. His first important film was *Gypsy Blood*, 1921, after which he went to Hollywood. By a series of musical comedies with Maurice Chevalier

in the leading part, including *The Love Parade*, 1929, *The Smiling Lieutenant*, and *One Hour with You*, he established his reputation as a brilliant and witty director. His later films include *Trouble in Paradise*, *The Man I Killed*, and *Heaven Can Wait*. He died Nov. 30, 1947.

Lublin. Town of Poland, the capital of a voivodship, 9,670 sq. m. in area, of the same name. It is 100 m. S.E. of Warsaw, on the Bistrzyca, a tributary of the Wieprz, and on the Warsaw-Kovel railway. It was long the second city of Poland, until in the 19th century it was superseded by Lodz. In appearance it remained inferior only to Warsaw. Its chief industries are brewing, and the manufacture of beet sugar, tobacco, candles, and soap; there is a considerable trade in corn, wine, linen, and woollen goods. Poland's independence was proclaimed here Nov. 9, 1918, by a workers' and peasants' council. Pop. (est. 1955) town, 132,200; voivodship, 1,719,000.

When the Germans invaded Poland in Sept., 1939, they bombed Lublin heavily from the air. After the partition of the country between Russia and Germany, Lublin town and co. were occupied by the Germans who set up at Maidanek (*q.v.*), close to the town, one of their chief extermination camps. Lublin town was captured by troops of Rokossovsky's 1st White Russian army in an assault by tanks, cavalry, and infantry on July 24, 1944. Next day a "popular assembly" meeting there invested with provisional powers a Polish committee of national liberation set up July 22 at Chełm, 43 m. to the E., and declared Lublin the temporary capital. The committee moved there, and on Dec. 31 proclaimed itself the provisional govt. of Poland. It was recognized as such by Russia, Jan. 5, 1945. The Russians liberated Warsaw Jan. 17, and on the 18th the Lublin govt. moved there. See Poland: History.

Lubricants AND LUBRICATION. Lubricants (Lat. *lubricus*, slippery) are substances used to reduce friction (*q.v.*) between two surfaces moving relative to one another; their application for this purpose is lubrication. Animal and vegetable fats and oils were the only lubricants until the mid-19th century; thereafter they were virtually superseded by mineral oils and greases, and in the 20th century synthetic materials have been

developed with superior properties. When surfaces are well lubricated, solid friction is decreased by fluid friction to as little as one ten-thousandth, with consequent reduction in the power needed to overcome the frictional resistance, temperature rise, possibility of seizure, and wear.

Lubrication is of two main types: fluid, or hydrodynamic, and boundary. Fluid lubrication occurs when there is a copious supply of lubricant between two surfaces moving relative to one another at moderately high speeds. A film of lubricant, about one-thousandth of an inch thick, is drawn in between the two surfaces, and maintained there by their relative motion. It is independent of the nature of the lubricant, depending solely on lubricant viscosity and relative surface speeds. High speed spindles can be lubricated with air or other gas under pressure, or by water.

When a journal is at rest it sinks through the lubricant, most of which is squeezed out, and direct contact may occur between the surface irregularities, according to the load. At low speeds and high load, insufficient lubricant is drawn in to maintain fluid friction; lubrication is then of the boundary type. This depends on the capacity of certain molecules to attach themselves to metal surfaces to provide a thin film, probably not more than a molecule thick, on each surface. These films, anchored to the metal and not squeezed out by pressure, reduce the friction considerably below that for dry contact; even so, the frictional resistance is at least three times more than with fluid lubrication, and then only with mineral oils containing fatty acids, fatty oils, or special oiliness additives. Otherwise, it may be thirty times as great.

To avoid high power losses, most machines are designed to maintain fluid lubrication as far as possible. Sometimes, as in gears, high contact pressures between similar metals are unavoidable, and then special E.P. (extreme pressure) additives are incorporated in lubricating oils to attack the metal surfaces at "hot spots" to form a protective film.

LUBRICATING OILS. These can be divided into distillates and residues. The former are produced by distillation and subsequent refining by solvents or acid treatment; the refined bulk is then re-distilled into fractions of different viscosities. Alternatively,

the unrefined bulk may be distilled into fractions, each of which is separately refined. Residual oils are usually obtained from crudes containing little asphaltic matter. Called S.R. (steam refined) oils, they are used for the manufacture of filtered cylinder stocks and bright stocks. The former are obtained after distillation to remove asphalt and dark colouring.

Refineries usually produce a relatively small number of basic oils which are blended to produce an oil to meet particular requirements. Fatty oils and special "dopes" or additives may also be introduced; for example, it is common practice to add oxidation inhibitors, anti-acid additives, and detergents to lubricants for I.C. and diesel engines. The constant churning of the oil in the crank case of these engines causes oxidation with the formation of a lacquer-like film on working surfaces and also sludge which, if circulated through the lubricating system, reduces power and increases wear. Oxidation inhibitors minimise sludge formation, deposits, and sticking.

Normal combustion in a petrol-engine produces water containing harmful acids which attack cylinder walls, especially when the engine is cold. Anti-acid additives in the oil seal the globules of water off from contact with the cylinder and piston, and eject them as steam when the engine warms up. If allowed to coagulate, carbon deposits block oil-ways and stick piston-rings, but a detergent added to the oil maintains the "soot" harmlessly in suspension.

Oil containing colloidal graphite is used for assembly and running-in of I.C. engines, and also as an upper cylinder lubricant. Foaming in the oil tanks of aero-engines is overcome by adding a silicone.

GREASES. This term embraces a broad class of oily or fatty materials of widely differing composition, ranging from semi-liquids to hard solids. Although greases are generally somewhat inferior to oil lubricants, they are more suitable where a non-splashing lubricant is required, the bearing is difficult of access, or the housing of a ball or roller bearing is not designed to retain oil. Grease lubricants are derived from mineral oil, or are synthetics, such as silicones. The former are more widely used.

Mineral greases are essentially mixtures of soap and oil. Usually the soap is made *in situ* and mixed with hot oil, the mixture being stirred whilst cooling. The "fat"

used for the soap may be tallow or fish, animal, or vegetable oil, and the base may contain aluminium, calcium, lithium, sodium, or strontium. Most industrial greases include soda or lime soaps.

Lime (or calcium) greases are general-purpose lubricants for moderate operating temperatures. They are insoluble in water but break down if dehydrated by overheating. Sodium greases are not water-resistant, but withstand higher temperatures. Aluminium greases have good water resistance and adhesiveness. They are very suitable as chassis lubricants and for application to chains, cams, and oscillating surfaces. Lithium greases combine high melting point (m.p.) and water resistance with excellent low-temperature properties. Barium greases are suitable for high temperatures, and have a water resistance equal to the best calcium greases. A number of greases have also been developed containing colloidal clay dispersed in oil.

SILICONE GREASES. Silicones are organo-silicon compounds in which silicon plays the part taken by carbon in orthodox organic compounds. They exist in various forms which include a range of greases. These greases are resistant to water and in general do not harden or melt over a wide temperature range. Most of them are unaffected by variations of from -40° F. to 350° F., some are unaffected by temperatures as low as -70° F., others by temperatures of slightly over 400° F. They can therefore be used in conditions for which mineral-oil greases would be unsuitable.

GRAPHITE. Chemically, this is carbon in the form of hexagonal plates which can be ground down to fine flakes. These flakes have a lubricating action and fill up the irregularities in bearings to give a highly polished and unctuous surface, so that seizing cannot occur and starting friction is reduced. They are also heat-resistant. Graphite is seldom used by itself, but as an additive to oil or grease, or as a colloidal suspension.

METALS. Thin films of caesium, chromium, aluminium, magnesium, and zinc are effective when applied to bearing surfaces where organic lubricants would vaporise.

LUBRICATION SYSTEMS. Machine bearings are lubricated by devices varying from simple oil-holes (hand oiling) or cups to elaborate automatic systems. The choice of system depends on speed, bearing pressure, and the lubricant.

There are three systems: *Total loss.* A comparatively small quantity of oil is delivered intermittently or continuously to bearing surfaces and runs to waste. Examples of methods in common use are drip-feed lubricators—an oil-cup with adjustable outlet; and a mechanical lubricator in which pumps operated by the engine deliver oil through pipes to the lubricating points.

Circulating. A relatively large quantity of oil is kept in circulation and delivered to bearings under pressure by pump or gravity from reservoir. Excess lubricant is returned to reservoir by gravity or scavenge pump. An example is the I.C. engine (where the crank-case forms the reservoir).

Bath and Splash. A typical example is the ordinary gear box where a pinion dips into oil and splashes it freely over bearings and moving parts; other variants are felt pads above, or in combination with, grooves in bushing or shaft, and either dipping into a well or fed by a cam or some form of lubricator; wicks, supplying oil from a reservoir by capillary attraction; or an oil-ring or an endless chain over the shaft and dipping into a reservoir.

Self-lubricating bearings are manufactured by sintering metal powders (usually bronze) with oil under pressure to form a hard but porous structure which will retain up to 30/35 p.c. of the oil.

Lucan (A.D. 39–65). Roman poet whose full name was Marcus Annaeus Lucanus. He was born at Corduba in Spain, a nephew of Seneca. Owing to the latter's high position at the court of Nero, Lucan started his career under the best auspices, and first attracted notice by a panegyric of the emperor. Later he incurred the jealousy of Nero, who regarded himself as a consummate artist, and viewed with disfavour the growing reputation of the young poet, and this estrangement from the emperor drove Lucan into the arms of those who under the leadership of Piso formed a conspiracy to assassinate Nero. The conspiracy was discovered, and Lucan denounced his own mother and others, but this did not save him, and he was compelled to commit suicide at 26. Had he lived longer Lucan might have done great work. As it is, the *Pharsalia*, an epic dealing with the fall of the Roman republic, especially the war between Caesar and Pompey, Lucan's hero, the only work of his which has been

preserved, is a poem abounding in many passages of brilliant rhetoric, if not true poetry. Trans. by N. Rowe, 1718; E. Radley, 1919.

Lucan, GEORGE CHARLES BINGHAM, 3RD EARL OF (1800–88). British soldier. Born in London,



3rd Earl of Lucan,
British soldier

April 16, 1800, he was the eldest son of the 2nd earl. Educated at Westminster School, he entered the 6th Foot in 1816, but saw no active service until the Crimean War. During 1826–30 he was M.P. for Mayo, and in 1839 succeeded to the earldom. In 1854 Lucan went to the Crimea in command of the cavalry division. This he led at Balaklava, and some part of the blame for the catastrophe there is his; Lord Raglan asserted it was due to the earl's failure to interpret instructions properly. Lucan was recalled to England, where, refused a court-martial, he defended his conduct in the house of lords, and published his divisional orders and correspondence. In 1887 he was made a field-marshal. Died Nov. 10, 1888.

The 5th earl (1860–1949), also a soldier, was chairman of the City of London Territorial Force Assoc., 1912–



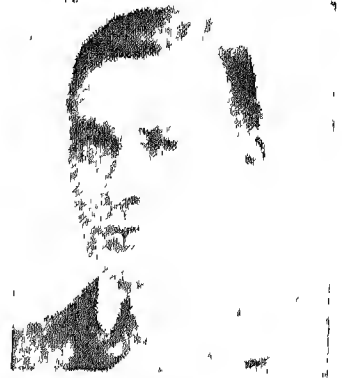
5th Earl of Lucan,
British soldier
Russell

41, and a captain of the corps of Gentlemen-at-Arms, 1931–40. He was succeeded by his son George (b. 1898). An eldest son is called Lord Bingham. Lucan is a small town 7 m. W. of Dublin.

Lucania. Ancient division of S. Italy. It lay between the Tyrrhenian Sea and the Gulf of Taranto, S. of Apulia, and N. of Bruttii. There were many flourishing Greek colonies on the coast. Lucania was conquered from the Oscans by the Lucani, an offshoot of the Samnites, in the 5th cent. B.C.; by the Romans 272–201 B.C. The name was applied in the early 19th cent. to Basilicata (part of ancient Lucania).

Lucas, EDWARD VERRALL (1868–1938). British writer. Kinsman of Lister, he was of Sussex Quaker stock, and at 16 was apprenticed to a Brighton bookseller, proceeding to University

College, London. In 1893 he joined the staff of the *Globe* newspaper. An authority on Charles and Mary Lamb, he edited the first complete collection of Lamb's letters, 1935. Lucas, who became chairman of the publishing firm of Methuen, was a master of authorship (*The Open Road*, 1899) and a distinguished essayist. His travel books included *Highways and Byways of Sussex*, 1901, and the *Wanderer* series, beginning with *A Wanderer in Holland*, 1905. Of his fiction, *Over Bemerton's*, 1908; *Mr. Ingleside*, 1910; *London Lavender*, 1912; *Verena in the Midst*, 1920; and *Rose and Rose*, 1922, were popular. They were very much "essayist's novels," urbane and good-humoured studies of pleasant social scenes and characters, with little in the way ofatory or incident. He produced many amusing satirical works, and wrote with discerning appreciation on painting and painters, especially Vermeer and Constable. A regular contributor to *Punch*, he also had a weekly article, *A Wanderer's Notebook*, in the *Sunday Times*, 1921–38. His reminiscences, *Reading, Writing, and Remembering*, appeared 1932, in which year he was made C.H. Died June 26, 1938.



E. V. Lucas,
British author
Russell

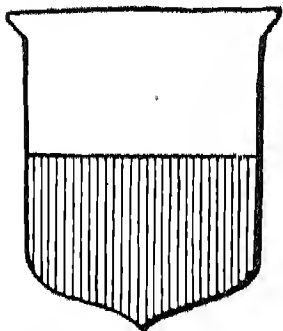
Lucas, JOHN SEYMOUR (1819–1923). British painter. Born in London, Dec. 21, 1819, he began his career as apprentice to a wood carver and sculptor, and his earliest artistic efforts were in this medium, but in 1870 he entered the R.A. schools. He first exhibited at the R.A. in 1872, was elected A.R.A. in 1886, and R.A. in 1898. He painted a fresco at the Royal Exchange, representing William the Conqueror granting the first charter to the City of London. He died May 8, 1923.

Lucas, VIVIAN DENIS (1818–77). French literary forger. A peasant's son, he was born in Eure-et-Loir, and, going to Paris in 1852, became assistant in a genealogical bureau. Elected a corresponding member of the archaeological society of Eure-et-Loir, he became head of a provincial library. After a prolonged study of old books, MSS., and autographs, he met Charles, the geometrician and astronomer, who was also an enthusiastic collector, and between 1861 and 1870 sold

him more than 27,000 forgeries for nearly £6,000. Lucas pretended that the documents were handed to him for disposal by an impoverished descendant of a count, a pre-Revolutionary collector. A feature in all the letters was the praise of France, and two represented that Pascal had forestalled Newton's great discovery. These were disclosed by Chasles and condemned as forgeries by Sir David Brewster. At last the French Academy became aware of the imposture, and in 1870 Lucas was sentenced, and disappeared from history.

Lucayos. Alternative name for the Bahamas (*q.v.*).

Lucca. Maritime prov. of N. Italy, in Tuscany. It is bounded W. by the Gulf of Genoa, and inland occupies the middle valley of the Serchio. Area, 555 sq. m. The prov. is hilly, fertile, and well cultivated. The products are wine, oil, silk, and chestnuts. The capital is Lucca



Lucca. Arms of the province

and the chief harbour Viareggio. Lucca was incorporated in Tuscany in 1847. Pop. (1951) 361,131.

Lucca. City of Italy, capital of the prov. of Lucca. It stands on the river Serchio, 15 m. N.E. of Pisa. Its fortifications, built 1504-1649, are remarkable and well preserved. The 11th-century cathedral is rich in sculptures, paintings, stained glass, etc.; there are many old and interesting churches and several fine palaces. The old ducal palace, used as a town hall, contains an important picture gallery. There are remains of a Roman amphitheatre and aqueduct. The chief manufactures are silk, jute, velvet, cotton, tobacco, and olive oil. Lucca is an agricultural centre. A few miles up the valley are the famous hot baths of Lucca. First mentioned as Luca 218 B.C., it was colonised by Rome 40 years later. Seat of a bishopric from 347, and of an archbishopric from 1726, in the Middle Ages it became an important city. It was a republic 1369-1797, when it was taken by the French. Napoleon I made it a principality for his sister Marianne Elise, Princess Bacciocchi, in 1805. Pop. (1951) 89,211.

Luce, HENRY ROBINSON (b. 1898). American publisher and editor. Born April 3, 1898, he was educated in Lakeville, Conn., and at Yale and Oxford. Until 1949 he was editor and publisher of Time,

which he founded 1923; he began the publication of Fortune in 1930, of the Architectural Forum in 1932, of Life in 1936, becoming in 1949 editor in chief of the group, to which he added House and Home, 1952, and Sports Illustrated, 1954. He was responsible for the topical film series, The March of Time, started in 1935. He married in 1935 Clare Boothe (*q.v.*), who was under her maiden name a successful playwright, and under her married name U.S. ambassador to Italy 1953-56.

Luce Bay. Extensive bay in the S. of Wigtownshire, Scotland. It penetrates inland for 16 m. and measures 18 m. across the entrance from the Mull of Galloway to Burrow Head. The quicksands along the N. and W. shores have caused many shipwrecks.

Lucena. Town of Spain, in the prov. of Córdoba. It stands on the river Casicajar, 37 m. by rly. S.E. of Córdoba. There are manufactures of bronze lamps, pottery, especially



Lucca, Italy. Campanile and façade of the cathedral of S. Martino

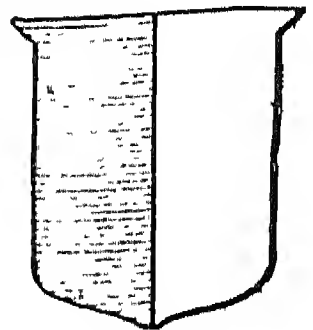
tinajas or oil and wine jars, wine, and brandy. A famous breed of horses is reared in the dist., in connexion with which there is a yearly fair. Pop. (1950) 35,830.

Lucera (anc. Luceria). City of Italy, in the prov. of Foggia. It stands in a plain 12 m. by rly. W.N.W. of Foggia, and is dominated by a castle founded by the emperor Frederick II early in the 13th century and rebuilt about 1280. It has a Gothic cathedral and a town hall containing antiquities. Silk is the chief manufacture. The city was destroyed by Comtans II in 663, but was restored in 1223 by Frederick II. Pop. (1951) 26,170.

Lucerne or ALFALFA (*Medicago sativa*). Species of medick. It is a deep-rooting perennial legu-

minous plant, with racemes of purple flowers. When sown by itself, or with a corn crop, it stands for several years, and is tolerant of thin, calcareous soils, for its roots strike down into the cracks of the underlying rock. It is sometimes made into hay, but is most valued for fattening stock, being cut in the green state.

Lucerne (Ger. Luzern). Central canton of Switzerland. It is situated in the basin of the Aar, other rivers being the Reuss and Emme. Its surface is mountainous, especially in the S. section, the highest peak being the (Brienzer) Rothhorn, 7,715 ft.

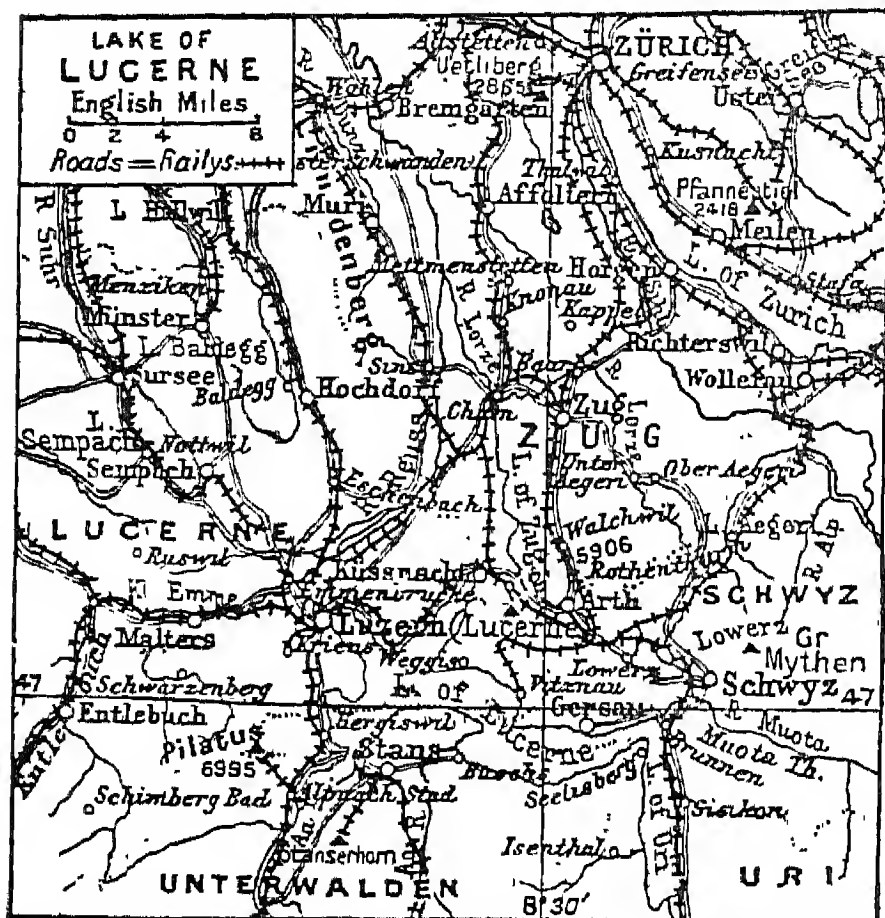


Lucerne. Arms of prov. and town

The canton contains the lakes of Sempach and Baldegg, and part of Lake Lucerne. The valleys are fertile, and many cattle are raised. There is a large trade in agricultural produce, chiefly butter and cheese. Most of the inhabitants are German-speaking and Roman Catholic. Lucerne threw off the Austrian yoke and joined the Swiss confederation 1332. Area, 576 sq. m. Pop. (1950) 223,249.

Lucerne (Ger. Vierwaldstättersee, lake of the four forest cantons). Lake of Switzerland. It is enclosed by the cantons of Lucerne, Schwyz, Uri, and Unterwalden, and is one of the most beautiful of the Swiss lakes, chiefly because of its irregular shape. Its length is 23 m. and its breadth varies from one half to 2 m. Its greatest depth is 701 ft., and its alt. 1,434 ft. above sea level; its area is 44 sq. m. The promontories that jut into it make it subject to sudden changes of wind and violent storms. Among the prominent landmarks are the peaks of Rigi, Pilatus, and Great Mythen. The first steamboat was put on the lake in 1835. The river Reuss flows into Lake Lucerne at its S.E. end and emerges at the N.W. corner. The lake of Lucerne is closely associated with the beginnings of Swiss history. During the Second Great War, the Swiss government's gold reserves were placed in watertight cylinders and sunk in the lake to protect them in the event of the country's being drawn into hostilities. Arrangements were also made for similar storage of emergency food supplies. See Switzerland; Tell.

Lucerne. City of Switzerland, capital of the canton of Lucerne. It stands on the N.W. arm of Lake



Lucerne. Map of the lake of Lucerne and the neighbouring country

Lucerne, at the point where the river Reuss leaves it, 59 m. by rly. S.E. of Basel and 25 m. S.S.W. of Zürich. Dominated by the Rigi and Pilatus (*q.v.*), it is partly enclosed by well-preserved walls with nine watch-towers, built in 1385. There are seven bridges, two of them roofed and decorated with paintings.

With fine quays and hotels, Lucerne is deservedly one of the chief tourist centres of Switzerland. The principal church, S. Leodogar or Ledger, was part of a Benedictine monastery rebuilt about 1633-35, and has a fine old organ. The town hall, which dates in part from the early 16th cent., contains the cantonal museum, with historical relics; there is also a museum of Peace and War, and in the Glacier Garden is the Lion of

Achille, Luchaire devoted himself to historical research, and after spending ten years as professor at Bordeaux, took in 1889 a chair at the Sorbonne, Paris. He died Nov. 14, 1908. Medieval history, French and Papal, was the subject of his lifelong study, and its first results

Lucerne. A picturesque place, alt. 1,500 ft., it is said to be named after its old water tower, which was once a lighthouse (*lucerna*). The city is first mentioned in 840; it came under the Hapsburg dominion in 1291, and joined the confederation in 1332. The pop., mostly German-speaking and R.C., was 60,526 in 1950.

Luchaire, Achille (1846-1908). French historian. Born in Paris, Oct. 24, 1846, and baptized as Denis Jean

graceful style Luchaire wrote two volumes of Ernest Lavisse's *Histoire de France*.

Luchu Islands. Alternative name for the Rikū Islands, Japan (*q.v.*).

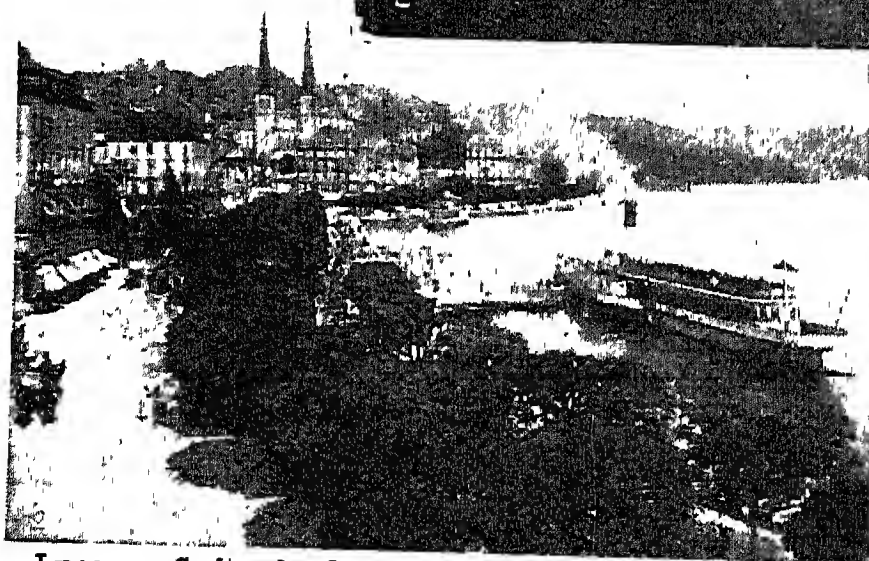
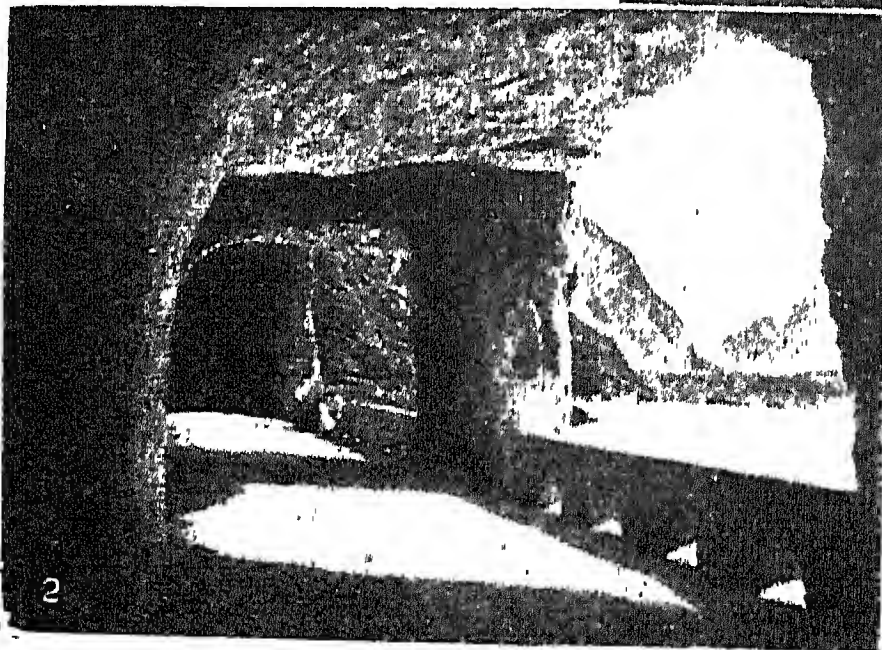
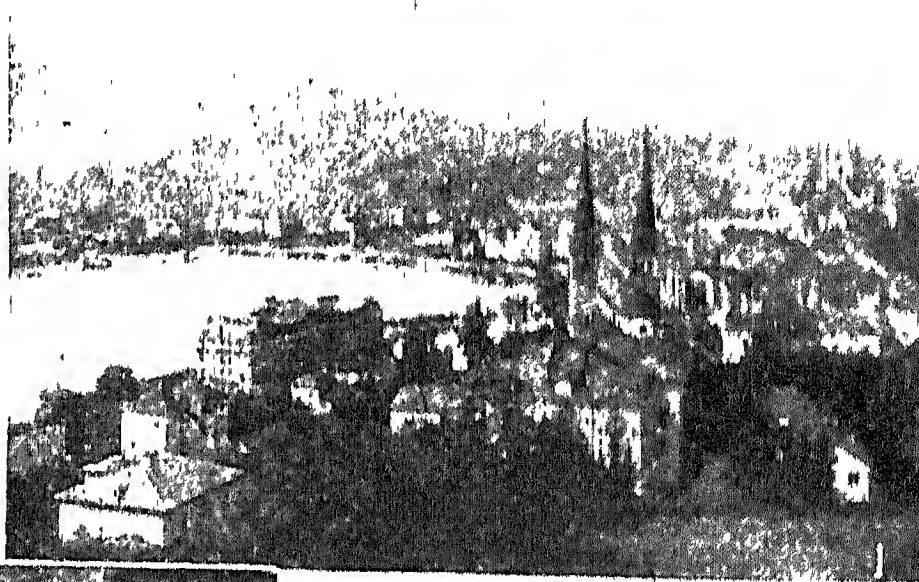
Lucian (c. A.D. 120-180). Greek satirist. He was born at Samosata, on the Euphrates, in Syria. Though



Lucian, Greek satirist From a bust

Greek was not his mother tongue, he wrote Greek prose reminiscent of the best period of Greek literature. According to his own account he was apprenticed as a youth to a

sculptor, but he became a travelling rhetorician, giving lectures and teaching in various cities in Asia Minor, Greece, Italy, and Gaul.



Lucerne, Switzerland. 1. General view from the east. 2. Axenstrasse, the road by the lake hewn in the mountain side. 3. Schweizerhof Quai and promenade, looking toward the Hotkirche, or church of S. Leodogar

He settled for some time at Antioch, then at Athens, and towards the end of his life received an official appointment in Egypt, where he died.

A sceptic by temperament, Lucian tilted against old faiths, philosophies, and conventions in the most audacious manner. His varied writings, grave as well as gay, afford a valuable picture of the manners of his age. To the modern reader he is one of the most entertaining of the ancient writers. Some of his most brilliant and diverting *jeu d'esprit* are cast in the form of dialogue, such as the *Dialogues of the Dead*, the *Dialogues of the Gods*, and the *Dialogues of the Courtesans*. In several of his pieces there are interesting references to Christianity. His *True History*, which was written to travesty the artificial romances of the period, anticipates such works as *Gulliver's Travels*, *Rabelais' Voyage of Pantagruel*, and *Cyrano de Bergerac's Journey to the Moon*. There are translations of his works by H. W. and F. G. Fowler, 1905; T. Francklin, 1780; and W. Tooke, 1820. See *Golden Age*.

were seen in his works on the early institutions of France. His great work, however, is his elaborate study of the life and times of Pope Innocent III, in six parts, tracing minutely the ramifications of that pontiff's ambitious and world-wide policy. In his clear and

Luciani, SEBASTIANO (1485-1547). Italian painter, also called Sebastiano del Piombo. Born at Venice, he studied under the Bellini and Giorgione, and about 1512 went to Rome, where he decorated the new Farnesina Palace with frescoes. At Rome he formed a strong friendship with Michelangelo, and collaborated with that artist with a view to driving Raphael from the field. With Michelangelo as composer and designer and Luciani as colourist of a picture, the plan nearly succeeded. Works by Luciani which were designed by Michelangelo include the Flagellation and Transfiguration, in the church of S. Pietro in Montorio, Rome, and the Raising of Lazarus, in the National Gallery, London. He excelled also as a portrait painter. After the death of Raphael he became Pope Clement VII's favourite painter.

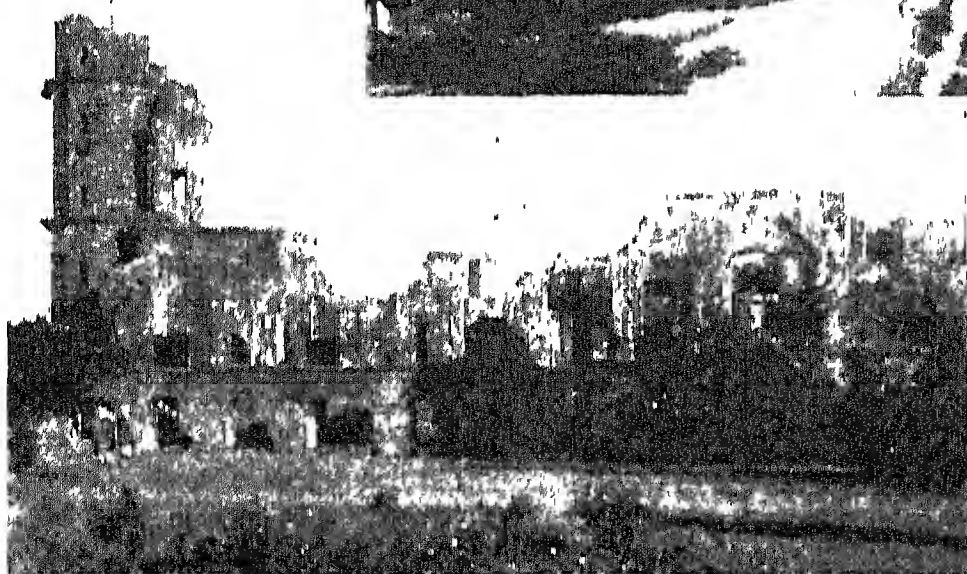
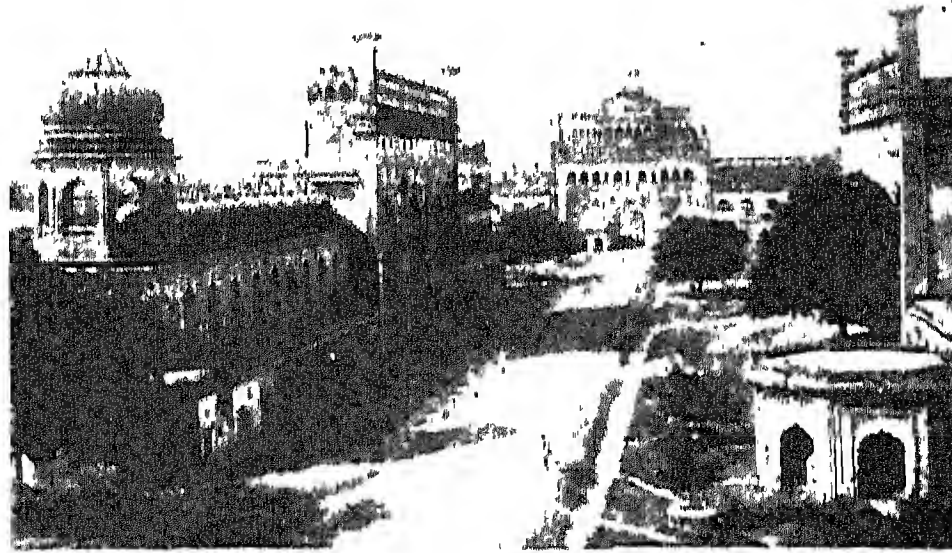
Lucifer (Lat., light-bringer). Name given to the planet Venus as the morning star; in mythology, the son of Aurora. In the O.T. (Isa. 14, v. 12) it is found as the translation of a Heb. word, *hēlēl*, which means literally "shining one." The term is used here as an epithet of the king of Babylon, and must really denote a waning luminary, perhaps the moon in its last quarter seen at dawn. A misinterpretation of this passage in connexion with Luke 10, v. 18, Rev. 9, vv. 1-11 led to the identification of Lucifer with Satan. *See* Devil.

Lucilius, GAIUS (c. 180-103 B.C.). A Roman satirist. Born at Suessa Aurunca, in Campania, a member of the equestrian order, the wealthy middle class of Rome, Lucilius was conspicuous in society but took no part in political affairs. He was a friend of Laelius the Wise and of Scipio Africanus the Younger, and served under the latter in the Numantine War. His comments on men and things were set down in 30 books of *Sermones* (talks), but all his works have been lost, with the exception of fragments surviving in later writers. These confirm the high estimation in which he was held by his own and immediately succeeding generations. Horace expressly men-

tions him as his model in this kind of poetry. Lucilius's writings, giving a descriptive account of contemporary life cast in hexameter verse, and interspersed with pungent criticism, constituted a new form of literature, and one which was a purely Latin invention.

Lucina. In Roman mythology, goddess of light and patroness of childbirth. She was often confounded with Juno and Diana, who also were patronesses of childbirth. *See* Hera; Juno.

Lucius. Name of three popes. Lucius I spent part of his eight months' papacy (253-254) in exile. Lucius II, a Bolognese, was



Lucknow, India. Ruins of the British residency, destroyed in the Indian Mutiny. Top picture, the Machi Bhawan fort, evacuated by British troops early in the siege

pope 1144-1145, a stormy period in which a revolutionary republic tried to remove the pope's temporal power. Lucius III, a Cistercian of Lucca, succeeded Alexander III, 1181-1185. Dissensions in Rome forced him to spend over three years in exile. His synod at Verona (1184) anathematised heretics. He died preparing a crusade, 1185.

Luck. Polish form of the name of the Russian town Lutsik (*q.v.*).

Luckenwalde. Town of E. Germany, in the *Land* (former Prussian prov.) of Brandenburg. It stands on the Nuthe, 31 m. S. of Berlin. It was a centre of the textile industry, and had

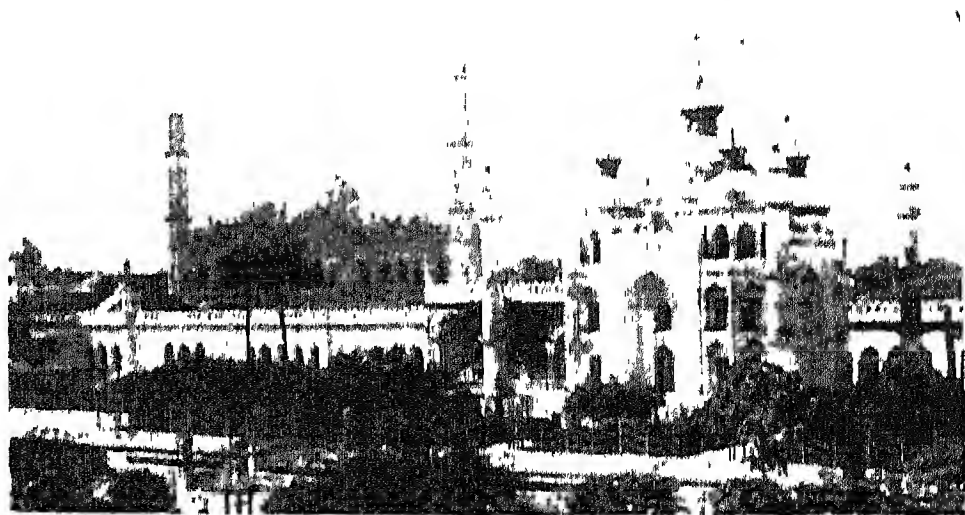
also dyeworks and other manufactures. Here in the Middle Ages was a monastery. A village in the time of Frederick the Great, it became a town in 1808.

Lucknow. Division and district of India, in Uttar Union. The division lies between the Ganges and Gogra rivers, and includes the district of Lucknow drained by the Gumti river and the adjacent districts of Unao, Rae Bareilly, Sitapur, Hardoi, and Kheri. The whole area forms a part of the treeless, stoneless plain of the Ganges and is almost perfectly level throughout, sloping on an average less than a foot per mile, in a general

north-west to south-east direction. There are usually three harvests annually; in the spring, wheat, grain, barley; in the rainy season, rice and millet; and in the autumn, native food grains. The district is fertile and highly cultivated, except in

the large and barren sandy tracts near the rivers. Communications are easily maintained by the railways and roads, but the rivers are of little value for traffic. Railways radiate from Lucknow city. Division: area, 12,002 square miles; pop. (1951) 7,152,237. District: area, 967 square miles; pop. (1951) 1,128,101.

Lucknow. City of India, capital of the Uttar Union and of Lucknow dist., on the river Gumti, 50 m. N.E. of Cawnpore. Tenth most populous city of India, it is the seat of the state legislature. Notable monuments include the Imambara or mausoleum of Asaf-ud-daula, the Jamá Masjid, the Chattr Manzil palace, the Kaisar Bagh, and the Farhat Baksh. Most of the city lies on the right bank of the Gumti. Among modern institutions the Canning and Mar-



Lucknow, India. View from Huseinabad Terrace; left, mausoleum of Asaf-ud-daula; right, Huseinabad mosque

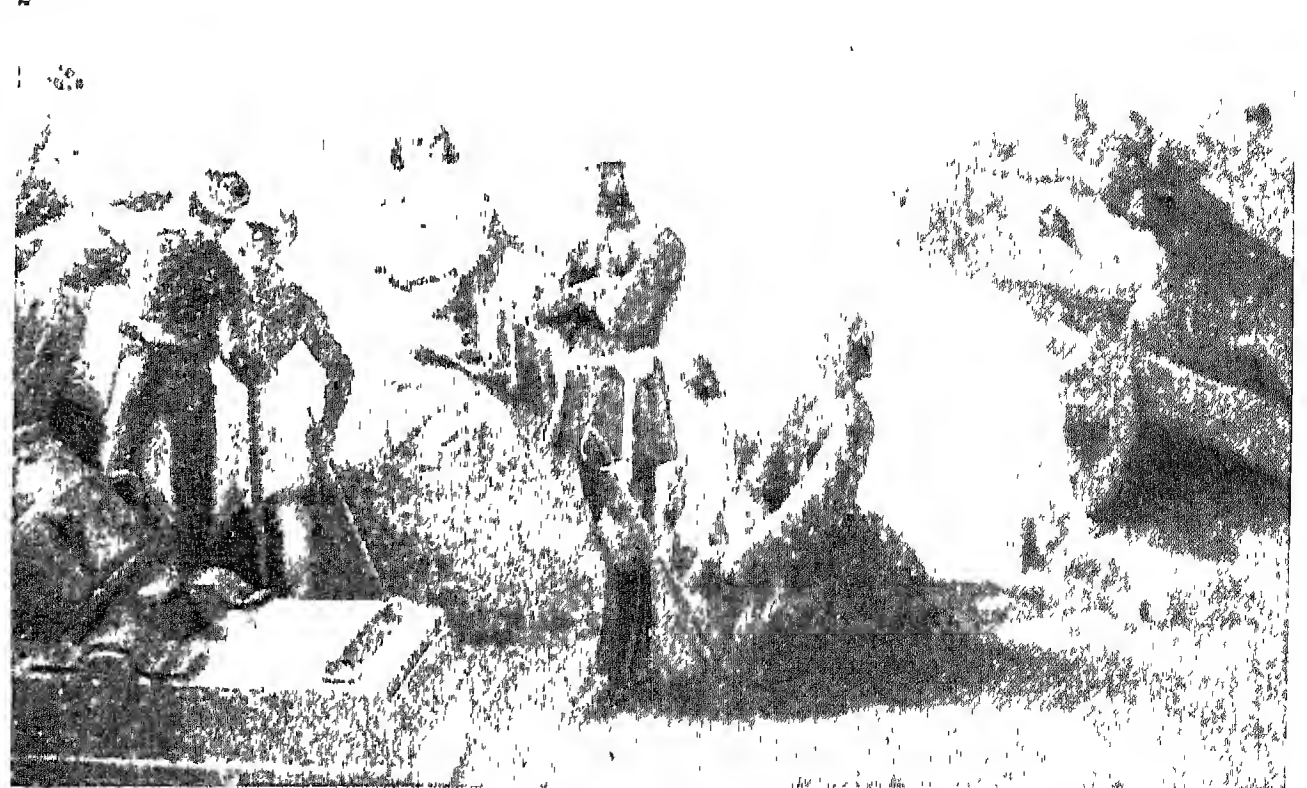
tinière Colleges are notable ; so too are the chief court, the legislative buildings, the museum, and Lucknow university (founded 1920).

Lucknow rose to importance in 1732 as the capital of the nawabs of Oudh, and became the storm centre of the mutiny of the Bengal Army of 1857. Lucknow still bears traces of that tragedy. The ruined residency, the heroic defence of which is commemorated by a memorial cross, was preserved as a monument and over it the Union Jack flew day and night until Aug. 15, 1947, when it was hauled down at the request of the government of the newly formed dominion of India. Industries include the manufacture of luxuries in silver, gold, ivory, silk, muslin, and glass. Railway workshops, cement and lime works, motor car works, and a paper mill have contributed to the city's prosperity. The offices of the Pioneer, formerly published in Allahabad, were moved here in 1931. Pop. (1951) 496,861.

Lucknow, SIEGE OF. Incident of the Indian Mutiny, 1857-58. Sir Henry Lawrence had foreseen the revolt of the Sepoys, and when it broke out, on May 30, 1857, he had already fortified and provisioned the residency or Government compound at Lucknow. Thither on July 2 he retired, with all the European inhabitants and the small garrison of 300 British soldiers, 36 volunteers, and a few hundred loyal Sepoys. On that day the siege of the residency by the mutineers began, and two days later Lawrence died of a shell-wound. For over 80 days the siege continued, the little garrison performing prodigies of valour, and, thanks to Lawrence's judgement and foresight, kept the mutineers at bay. Then on Sept. 25 Sir Henry Havelock and Sir James Outram, with 2,500 men, broke through and reached the residency, of the defence of which Outram then took command.

On Nov. 10 Sir Colin Campbell, who had advanced from Cawnpore with 5,000 men and 30 guns, relieved the Alum Bagh, and the residency, Nov. 16, but his force was not sufficient to dislodge the rebels from the city, so he took away the beleaguered garrison with its women and children. By Jan. 1858, the rebels had strongly fortified Lucknow, but two months later Campbell began the siege, and by March 19 the whole city had fallen into British hands. See Lucknow and Oudh in the Mutiny, J. J. McL. Innes, 1895.

Lucretia. In Roman legend, wife of Lucius Tarquinius Collatinus. During the siege of Ardea



Lucknow. Jessie's Dream. It is said that during the siege of Lucknow, Jessie Brown, a corporal's wife, heard in a dream the bagpipes of the relieving force and heartened the beleaguered garrison to hold out until Sir Colin Campbell arrived.

From the picture by Fred. Goodall, R.A., in the Sheffield Corporation Art Gallery.

(510 B.C.) the royal princes paid a surprise visit to their wives, all of whom were found feasting except Lucretia. Sextus Tarquinius, son of King Tarquinius Superbus, inflamed by her beauty forced her to yield to his desires. On the following day Lucretia stabbed herself in the presence of her father and her husband. Junius Brutus, cousin of Tarquinius, seized the dagger and raised it as a standard of revolt. The Tarquins were driven from Rome and the monarchy was overthrown.

Lucretius (c. 98-55 B.C.) Roman poet and philosopher, whose full name was Titus Lucretius Carus. He was a contemporary of Cicero and Caesar, but hardly anything is known of his life, although his great philosophic poem in six books, *De Rerum Natura* (On Nature), ranks as one of the world's masterpieces. *De Rerum Natura* is an attempt to express the author's system of Epicurean philosophy and thus to afford his fellow-men a rational explanation of life and matter destined to free them from the terrors and cruelties springing from superstition and ignorance, especially, in his view, from belief in divine intervention. Hence he inquires into the causes of the most alarming natural phenomena. Intensely earnest, he is animated by pity for the self-torturing human race.

The poem suffers considerably from the fact that Lucretius is a philosopher first and a poet second. Except for the hexameter form, many passages where the author is attempting to explain some phenomenon or drive home some truth are indistinguishable from prose. Yet the general conception is in so lofty a plane that the reader never loses sense of the presence and in-

spiration of a great creative mind, while a vein of noble poetry runs through the whole structure, and in certain parts, especially where he broods over the great mysteries of life and death, Lucretian rises to heights touched by no other Roman poet. The hexameter in his hands did not reach the perfection to which Virgil brought it, yet it has a strength and stateliness which accord well with the subject.

Though Lucretius was not a scientist in the modern sense, it is astonishing how many of the theories he propounded anticipate the discoveries of modern times. His conception of the phenomenon of light was in advance of Newton; his notion of the atomic constitution of matter accords with discoveries made in 20th century analyses of physics and chemistry; while his famous account of the origin of life and the development of human society anticipated the doctrine of evolution. Consult Lucretius (text, commentary, and translation), H. A. J. Munro, 1908; Roman Poets of the Republic, W. Y. Sellar, new ed. 1881; Latin Literature, J. W. Mackail, 1895.

Lucrino (Lat. *Lucus Lucrinus*). Small lagoon of Italy. It is about 13 m. W. of Naples and $\frac{1}{2}$ m. S. of Lake Averno (*q.v.*), and is separated from the Gulf of Pozzuoli by a dyke. Much larger in Roman times, the volcanic upheaval of Monte Nuovo (alt. 455 ft.) on Sept. 30, 1538, half filled the lake and destroyed the harbour, *Portus Julius*, built by Agrippa, and the canal connecting it with Lake Averno. Famed then, as now, for its oyster beds, its banks were studded with Roman villas, including Cicero's *Academia*. The *Via Herculeia*, an ancient embankment, can be seen below the surface.

Luculi. Irregular specks of light covering the surface of the sun. They were first noted by Short, the optician, during the eclipse of July 14, 1748. They gave to the sun, according to Short, a mottled appearance like the skin of an orange; and it seems not unlikely that Short perceived what are now called granulations. *See* Sun.

Luculia gratissima. Ever-green shrub of the family Rubiaceae. A native of the Himalayas, it has opposite, elliptic leaves, and rosy, tubular, fragrant flowers in large clusters at the end of the shoots.

Lucullus, LUCIUS LUCIUS (c. 110-57 B.C.). Roman soldier and epicure. He served in the Social War (90-89), and again under Sulla in the first Mithradatic War (88-84). In the third Mithradatic War, which began in 74, he was in chief command for some eight years. He conducted his campaigns with great military skill, and succeeded in driving Mithradates out of his kingdom of Pontus. In 69 he defeated Tigranes, king of Armenia, with whom Mithradates had taken refuge, but he penetrated too far into Mesopotamian Armenia, and, his soldiers becoming disaffected, he was compelled to return to Asia Minor.

In 66 Lucullus was superseded by Pompey, and devoted his retirement to the gratification of his luxurious tastes by means of the vast wealth he had amassed in Asia. He was, however, a generous patron of art and letters, and collected a fine library, which he freely threw open to the use of those likely to benefit by it. His gardens on the Pincian Mt. and his villas at Tusculum and Neapolis were famous. The splendour of his banquets became proverbial. He is said to have introduced the cherry from Cerasus. There is a *Life of Lucullus* by Plutarch.

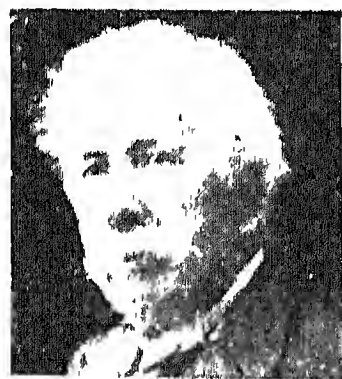
Lucy. Name of an English family. It traces descent from Thurstan de Cherlecote, whose son Walter was given the village of Charlecote in Warwickshire c. 1190. Sir Thomas Lucy (d. 1600), who rebuilt the manor house there, was knighted by Elizabeth in 1565. High sheriff for his county, he is interesting mainly for his alleged association with Shakespeare; according to a story current at Stratford about 1585, Shakespeare stole deer at Charlecote, was prosecuted by Lucy, and fled to London, where he took his revenge by satirising the knight



Luculia gratissima. Leaves and flower-head of this Indian shrub

as Justice Shallow in King Henry the Fourth. In 1947 Sir Henry Montgomerie Fairfax-Lucy, 4th bart., presented Charlecote to the National Trust.

Lucy, SIR HENRY WILLIAM (1845-1924). British journalist. Born Dec. 5, 1845, at Crosby, and educated in Liverpool, he was apprenticed to a merchant. Beginning his journalistic career as chief reporter of *The Shrewsbury Chronicle*, he studied at the Sorbonne, Paris, and became the best known parliamentary press writer in England, contributing to leading London, provincial, and American papers. He worked for the *Daily News* from 1873, and was Toby, M.P. of *Punch* 1881-1916. He is believed to have originated lobbying, and published numerous books on parliament and parliamentarians. He gave £1,000 in 1903 to found a trust to aid gallery men in need, and £1,000 in 1913 to endow a bed in the London Hospital for parliamentary journalists. He was knighted in 1909, and died Feb. 20, 1924, at his country house near Hythe.



Sir Henry Lucy, British journalist
Russell

Lucy Ashton. Railway paddle steamer of the Clyde, built in 1888. She was 190 ft. long, and in 1950 was used in the Gareloch for testing a ship's resistance.

Luddites. The name given to bands of rioters who appeared in the midland counties of England in 1811. Industrial distress was acute, and bodies of unemployed went about breaking machinery, which they regarded as the cause of their misfortunes, especially in Notts and Leicestershire. The riots continued in 1812 and broke

out again in 1816, extending into Lancs, Yorks, and other parts of the country. By accident the rioters became known as Luddites, a mentally deficient boy named Ned Ludd, living in a Leicestershire village, giving his name to the movement. The story goes that, when annoyed by some other boys, he chased one of them, and, failing to catch him, in his anger destroyed some stocking frames. When others were destroyed by the rioters, it became usual to put the deed down to Ludd, while the leader of a band called himself General Ludd. *See* Industrial Revolution; consult *Risings of the Luddites, Chartists, etc.*, F. Peel, 1888.

Ludendorff, ERICH VON (1865-1937). German soldier. He was born April 9, 1865, entered the army from a cadet school, 1882, and served on the general staff 1898-1914, working from 1904 in the operations section which planned the German attack on France through neutral Belgium. As a maj.-gen. on the staff in the 2nd army, he received the surrender of Liège in Aug., 1914 (*see* Leman, G.M.J.G.; Liège). On Aug. 22 he became chief of staff to Hindenburg (*q.v.*) on the Russian front, where he was mainly responsible for the German victory at Tannenberg and for the successes of 1915. After the attack on Verdun (1916), which he had opposed with Hindenburg, who feared a failure, he and Hindenburg were placed in virtually supreme command of all German forces, Aug. 29, 1916. Ludendorff organized the army and devised new methods of attack. He proved himself a bold strategist, but with great talent rather than genius; cold and heartless, lacking that deeper insight which marks the supreme leader. At the end of Sept., 1918, when the German army was facing defeat, he called for immediate peace negotiations, but when these were eventually opened he refused his consent, and was dismissed, Oct. 28, 1918.



E. von Ludendorff, German soldier

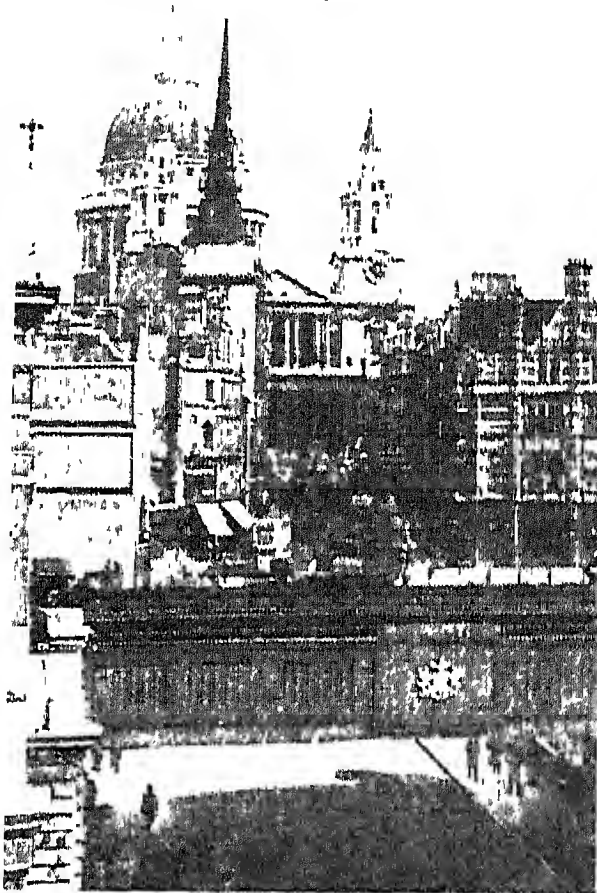
After the war he wrote his *War Memories*, 1919; *The General Staff and its Problems*, 1920; and *Warfare and Politics*, 1922. He was involved in several nationalist risings, and on Nov. 11, 1923, marched with Hitler in

the unsuccessful *putsch*. But later a coolness developed between Hitler and himself, and he played little part in public life. Occasionally he attacked his former chief Hindenburg, and was a bitter opponent of the Christian church, declaring himself to be a pagan. He died at Munich, Dec. 20, 1937. *Consult* Life, L. Buat, 1920.

Lüderitz OR LÜDERITZ BAY. Port of S.W. Africa, in Namaqualand. Originally named Angra Pequena by Dias de Novacs, who landed in 1486, it was renamed after a German, Adolf Lüderitz of Bremen (drowned off the coast 1886), who founded a settlement here in 1883. Situated 150 m. N. of the mouth of the Orange, in a sterile and arid region, the town owes its existence to a rich diamond field, and has fish canning factories. Water has to be brought by train from Garub, 65 miles inland, supplemented by distillation of sea water. An average of 100 ships enters and clears Lüderitz annually, handling some 16,000 tons of cargo, mostly imports. Pop. (est.) 4,000.

Ludgate. Gate of old London. It stood on the W. side of the wall, near to the Old Bailey. According to tradition it was built 66 B.C. by King Lud, but, that monarch being more or less mythical, its name is derived by modern authorities from a Saxon word meaning postern. First mentioned in 1100, it was repaired in 1215 and 1260, rebuilt 1586, and restored after the Great Fire. It was a debtors' prison 1378-1419, was held for Queen Mary by Lord William Howard against Sir Thomas Wyatt in 1554, and was demolished in 1760. Its statue of Elizabeth was removed to a niche in the outer wall of S. Dunstan's-in-the-West, Fleet Street.

Ludgate Hill. A London thoroughfare. It extends E. from Ludgate Circus, where it is crossed by a rly. viaduct, to S. Paul's Churchyard. At one time the name applied only to the part from the Fleet Bridge to the old gate; the extension from the gate to S. Paul's Churchyard being first called Bowyer Row and then Ludgate Street. It was widened in 1864, when Ludgate Circus was formed, and in 1893. On the N. side the church of S. Martin, built by Wren in 1684, replaced a structure dating from 1437 and destroyed in the Great Fire. Samuel Purchas (*q.v.*) was rector in 1613. Ye Old London Coffee House tavern, marking, approxi-



Ludgate Hill, London. View looking east, showing S. Paul's Cathedral and the spire of S. Martin's

mately, the site of the old gate, succeeded the London Coffee House, 1731-1867, once kept by the grandfather and then by the father of John Leech (*q.v.*), the caricaturist, and a meeting-place for London publishers. On the S. side are the shops of several religious book societies. Bombs created large gaps on both sides during the Second Great War. The viaduct was hit, and wine vaults in the arches below were seriously damaged. Incendiary bombs destroyed the premises of Cassell and Co., and Treloar's carpet warehouse was among the shops that disappeared. The roof of Stationers' Hall, in Stationers' Court, was burnt. *See* La Belle Sauvage; *consult also* Ludgate Hill Past and Present, W. P. Treloar, 2nd ed. 1892.

Ludhiana. Dist. and town of India, in the Jullundur division, Punjab state. The district lies S. of the Sutlej in the E. of the state; three-quarters of it is cultivated, and yields wheat and grain. There is a little irrigation from one of the branches of the Sirhind Canal. Most of the people are hard-working Jats. Area, 1,452 sq. m. Pop. (1951) 808,105.

The town, which is 110 m. E.S.E. of Lahore, is an important rly. junction in the centre of the dist., with a large trade in wheat; it specialises in textiles, particularly Kashmir shawls and turbans. Pop. (1951) 153,795.

Ludi. A Latin word meaning games; also applied to athletic training institutions and educational and art schools (music, rhetoric, reading, and writing).

Roman games may be classed as private or public, provided by individuals to gain public favour or commemorate events in their lives; regular or extraordinary; circus, amphitheatre, or theatrical. The games were in their origin essentially religious. Twice a year (March 14, Dec. 15) chariot and horse races, under the superintendence of the pontifex maximus, were held in the valley between the Aventine and Palatine hills in honour of Mars and Quirinus, the patron deities of horses. Later, these were supplemented by *ludi scenici*, dramatic performances introduced from Etruria. From an early date games were celebrated in honour of Jupiter by triumphant generals on their return from a campaign. These *ludi Romani*, or Roman games, later developed into a yearly festival, even if no triumph justified them. Superintended by the curule aediles, they at first lasted only one day (Sept. 15), but afterwards extended over 14 or 15 days.

The *ludi plebei*, or plebeian games (220 B.C.), held by the plebeian aediles in the Circus Flaminius, were supposed to commemorate the secession to the Sacred Mount. The *ludi Apollinares* (212), held by the city praetor, were introduced in honour of Apollo during the 2nd Punic War, it having been predicted that the Carthaginians would never be driven out of Italy until the god had been so honoured; the *ludi Megalenses*, or games in honour of the Great Mother of the Gods, were instituted (204) with the same object, on the removal of the sacred stone, supposed to represent the goddess, from Pezennus, in Phrygia, to Rome. Other games were held in honour of Ceres, Flora, and other divinities.

The *ludi saeculares*, or secular games, established in early republican times in obedience to the Sibylline books, were held at intervals of 100 to 110 years. They lasted three days and three nights, the most magnificent celebration being in the reign of Philip the Arabian (A.D. 247), to commemorate the 1,000th anniversary of the foundation of Rome. These games were managed by certain officials, called "the fifteen" (originally two), who had the care of the Sibylline books. A famous ode of Horace was written on the occasion of these games during the reign of Augustus.

Ludlow. Semi-mechanical type-composing machine. It differs from other slug-casting machines, such

as the linotype (*q.v.*) and intertype, in that it is not operated by means of a keyboard. The matrices required for the casting unit are assembled and spaced by hand.

The compositor gathers about three to eight matrices in the order required and places them in the Ludlow stick at one operation. The speed of assembling in this way is appreciably quicker than setting type by hand. Having placed all the matrices for the line in the stick, spaces are inserted between the words, and this process is facilitated by the standard widths of the spaces and corresponding markings on the assembly stick. The stick containing the line of justified matrices then becomes the mould for casting. It is placed in a groove on the top of the machine and locked in position. A lever starts the mechanism whereby the mould moves to the casting position, molten metal is pumped into it, and the slug is cast. The stick is then removed from the machine and the matrices distributed back into the cases. Meantime, the slug is trimmed by the machine and finally delivered on to a galley. The metal employed is the same alloy of lead, antimony, and tin that is used by other slug-casting composing machines.

Ludlow. Mun. borough and market town of Shropshire, England. It stands on the Teme, where it is joined by the Corve, 27 m. S. of Shrewsbury, with which it has rly. connexion. Interest in the town is mainly historical. The church of S. Lawrence is a cruciform building in the Perpendicular style, and there is a grammar school founded in the 13th century. The castle ruins include the Norman keep, the council hall, Mortimer's Tower, and a Norman chapel. Broad Gate, one of the town gates, still stands. Of the old houses the most notable is the Feathers Inn.

Ludlow grew up around a castle built by the Normans, and was an important place on the marches of Wales. It became a borough, and was separately represented in parliament from 1471 to 1885. The court of the marches held its meetings here until its abolition about 1700. The castle, the residence of the president of the marches, was destroyed after its capture in 1646 by the parliamentarians. Ludlow is one of England's most beautifully situated towns. It gives its name to a county constituency. Market day, Mon. Pop. (1951) 6,455. *See* Inn.

Ludlow, EDMUND (c. 1617-92). English politician and author. Born of a Wiltshire family, the son of Sir Henry Ludlow, he



Edmund Ludlow,
English politician

was educated at Trinity College, Oxford. When the Civil War broke out, he joined the parliamentary army, was made governor of Wardour Castle, and after its surrender saw service in the field. In 1646 he entered parliament for Wiltshire. He favoured Pride's Purge, was a member of the court that tried Charles I, and signed the death warrant. A member of the council of state, he went to Ireland in 1651, and was for about a year in command there. He appeared next as an opponent of Cromwell. In 1659 he re-entered parliament, sat on the council of state, and went as commander to Ireland. At the Restoration, Ludlow was turned out of the Convention parliament, and as one of the regicides was condemned, but escaped to Switzerland, where he died.

Ludlow, JOHN MALCOLM (1821-1911). British lawyer. Born in India, March 8, 1821, he was educated in Paris, and became a barrister, Lincoln's Inn, 1843. A Christian Socialist, he helped secure the passing of the Industrial and Provident Societies Acts, 1852 and 1862. He was registrar of friendly societies, 1874-91. He died Oct. 17, 1911.

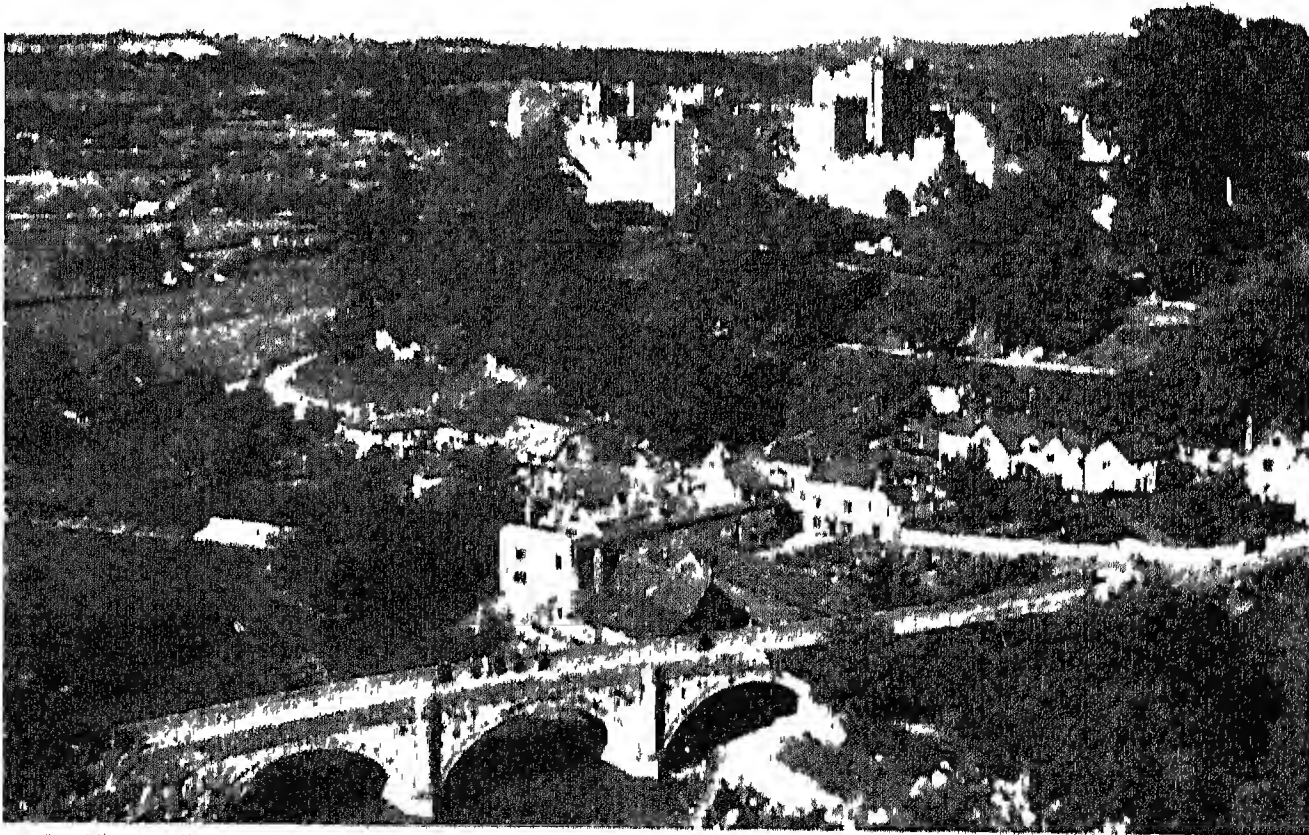
Ludlow Group. In geology, the uppermost subdivision of the

Silurian rocks in Great Britain. They consist mainly of shales, passing gradually into the Old Red Sandstone. The group is so called from its typical development near Ludlow. It abounds in fossils, notably *Cyathospis ludensis*, the earliest British vertebrate fossil, trilobites, brachiopods, gastropods, etc. *See* Silurian.

Ludwig. German form of Louis. Certain German kings sometimes called Ludwig, sometimes Louis, are entered under Louis.

Ludwig, EMIL (1881-1948). German-born Swiss dramatist and biographer. Of Jewish stock, his real name being Cohen, he was born at Breslau, Jan. 25, 1881. Educated at the university there and at Heidelberg, he made an early reputation as a writer of verse plays. Of his later pieces, *Versailles*, produced in London 1932, contained portraits of Lloyd George and Clemenceau. After the success of his *Goethe*, 1920, Ludwig devoted himself chiefly to biography, dealing with Napoleon, 1925; Bismarck, 1927; Lincoln, 1930; Hindenburg, 1935; Beethoven, 1945. *Gifts of Life*, 1931, was autobiographical. *The Germans*, 1942, was much discussed. A Swiss citizen from 1932, Ludwig died Sept. 17, 1948.

Ludwig, KARL FRIEDRICH WILHELM (1816-95). German scientist. Born at Witzenhausen, Hesse, Dec. 29, 1816, he studied physiology at the universities of Erlangen and Marburg. He became professor at Marburg in 1846; in 1849 he went to Zürich, and in 1855 to Vienna. From 1865 he was professor of physiology at Leipzig, where he died April 23, 1895. Ludwig is known for his discoveries in regard



Ludlow, Shropshire. Ancient stronghold of the English border. Ludlow Castle stands nobly on a hill above the junction of the rivers Corve and Teme

to the movements of the blood and lymph, for his invention of the kymograph, mercurial blood-pump, and other apparatus for conducting experiments. His chief work is a Text Book of Human Physiology, 1852-56.

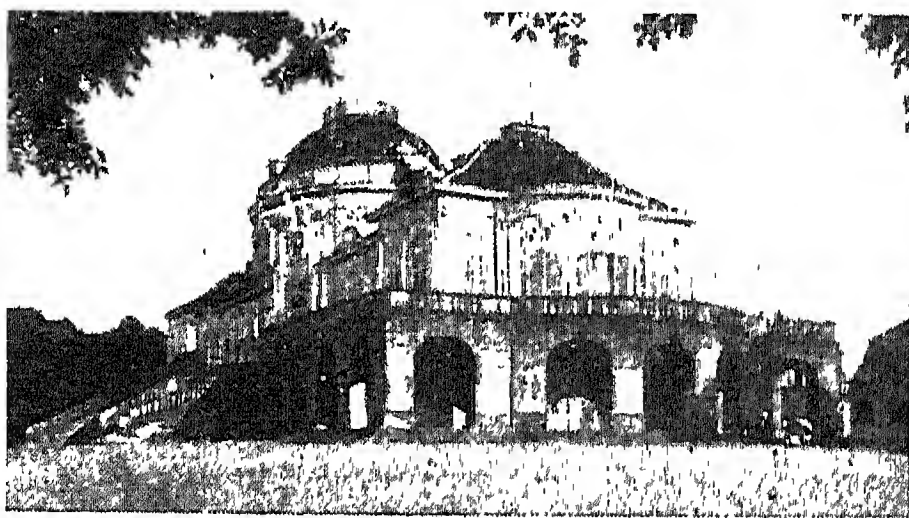
Ludwig, Otto (1813-65). German author. Born Feb. 11, 1813, at Eisfeld, in Saxe-Meiningen, he struggled against illness and poverty. Like Hebbel a pioneer of realism, he published two powerful tragedies, *The Hereditary Forester*, 1853, and *The Maccabees*, 1855, distinguished by masterly technique and vigorous character drawing. Of his tales, *Between Heaven and Earth*, 1857, is the most famous. His Shakespeare Studies, 1871, illustrate his theories of dramatic composition. Ludwig died Feb. 25, 1865.

Ludwigsburg. Town of Württemberg-Baden, W. Germany, 9 m. N. of Stuttgart, near the Neckar. The chief building is the palace, formerly the residence of the rulers of Württemberg; it is a magnificent edifice in a fine park; others are churches and buildings used for public purposes. Ludwigsburg was founded in 1704. when Eberhard Louis, duke of Württemberg, in

a fit of pique, decided to leave Stuttgart. A town grew up around his new palace and his successors added to its buildings. It became also the military centre of Württemberg and later a thriving industrial centre, with textile, metal, surgical instrument, food etc., factories, and a spa. Near the town is the hunting lodge of Monrepos, also, until 1918, a residence of the king of Württemberg. Pop. (pre-war) 34,135.

Ludwig's Canal. Inland waterway of Bavaria, Germany. It was built, 1836-45, under Ludwig I of Bavaria and named after him, and links the Danube with the Main, and thereby the Black Sea with the North Sea. Utilising the Regnitz and the Altmühl, tribs. respectively of the Main and the Danube, and with over 100 locks, it was only 5 ft. deep and 108 m. long. Part of it was incorporated in the huge Rhine-Main-Danube Canal started 1926, still incomplete 1939, which, with only 24 locks, admits ships of 1,200 tons and produces electric power on a large scale.

Ludwigshafen. Tn. of Rhine-land-Palatinate, W. Germany. On the left bank of the Rhine opposite Mannheim, it developed rapidly. Though founded in 1606 as a fortified bridgehead, it received its present name only in 1843, and urban rights in 1859. Its pop. increased from 3,900 in 1864 to 108,000 in 1950. Originally a trading centre for grain, coal, fertilisers, iron, etc., it became a thriving centre of the chemical industry, the German Dyestuffs federation, later merged in the I. G. Farbenindustrie, having been established in 1865. Over 20,000 workers were employed in the factories, producing explosives and other chemical products, and metal, textile, wood, and other factories were built. The port, with 6 basins, received more than 12,000 vessels a year. The town was a good example of planned building and had wide streets.



Ludwigsburg, Germany. Schloss Solitude, in the environs of the town formerly a military school which Schiller attended in 1773-75

During the First Great War it was attacked by air, and during the latter stages of the Second was almost destroyed. It was taken by armoured units of the U.S. 3rd army, March 21, 1945, and was included in the French zone of occupied Germany.

Ludwigslust. A town of E. Germany, in the area which came under Russian occupation after Germany's surrender in 1945. It is 27 m. N.N.W. of Wittenberge, being a rly. junction on the Berlin-Hamburg line. The manufactures include cloth and chemicals, and the buildings two palaces and several churches. "The pleasure of Louis," the town grew up around the palace built in 1770-80 by Frederick II, grand duke of Mecklenburg-Schwerin, in honour of his father, Christian Louis. Another royal palace was erected, and the grand dukes had residences here until the changes of 1918. Pop. (1950) 14,000.

Luff. Side of a ship next the wind; the forward, or weather, edge of a sail. To luff is to bring a

vessel's head nearer to the wind; to luff up is to throw her head right into the wind.

Lufthansa (Ger.). Abbreviation of Deutsche Lufthansa (German air union). Founded in 1926, to maintain a daily air mail and passenger service between Weimar and Berlin, Lufthansa eventually operated all air transport services over German territory and had controlling interests in the German-Chinese company Kumaia and the Brazilian Condor syndicate. It was a pioneer in the use of the multi-engined, all-metal, commercial monoplane; and established the first regular air service across the S. Atlantic. Lufthansa introduced the ocean seaplane tender with the Westfalen, a ship stationed in the S. Atlantic midway between Bathurst (Gambia) and Pernambuco (Brazil) for refuelling aircraft. It also initiated the catapulting from Atlantic liners of aircraft carrying urgent mail. The Bremen and Europa were so fitted, enabling letters to arrive in Bremen or New York one day ahead of the ship. Lufthansa operated 80 separate European services and 10 S. American.

Luftwaffe (Ger., air weapon). The existence of the German air force, known under this name, was admitted by Hermann Goering (g.e.), its first c. in c., in a proclamation of March, 1935. This was a direct contravention of the provisions of the Versailles treaty, which laid down in 1919 that the defeated German nation should have no military or naval air force or personnel, and restricted the size and numbers of its civil aircraft.

Even in pre-Nazi days much ingenuity went to the secret building up of air strength. There was an air intelligence department at the defence ministry from 1922, and an international air agreement, 1926, eliminated the restrictions on civil aviation, so that the commercial Lufthansa (g.s.) became the largest and one of the most efficient air line organizations in Europe. Many of its standard aircraft were clearly designed for easy conversion to military use, and as many crews as possible were trained in long distance navigation. Another source of potential flying strength was the flourishing gliding movement, officially encouraged and developed.

As soon as the Luftwaffe openly ranged itself among the world's fighting forces, Goering and his air staff, chief among them Erhard

Milch and Ernst Udet, decided to test their more promising aircraft and their tactical theories on the battlefield. Some 200 operational aircraft and 50 transports were sent to equip the Condor Legion (*q.v.*) in the Spanish Civil War. The c.-in-c. was General Sperrle, later to command the 3rd air fleet against Great Britain. The Messerschmitt 109 fighter, Junkers 87, Dornier 17, and Heinkel 111 bombers, as well as the Junkers 52 transport, were all used in Spain, and were sufficiently successful to be put into large-scale production.

At the time of the occupation of Austria (1938) and Czechoslovakia (March, 1939), first-line strength of the Luftwaffe had reached 4,000 aircraft, and was impressive in its obvious flexibility of movement. This was to remain a feature of the Luftwaffe, in which squadrons and groups could be switched swiftly where required, thanks to the generous provision of Ju 52 aircraft.

The German air staff had decided to concentrate on the production of single-seat fighters in which class the Me 109 long held its own -- and the Dornier and Heinkel medium-size bombers, in which armament and bomb-load were sacrificed to performance. While the Luftwaffe had relatively weak opposition -- particularly, as in the Low Countries, against an enemy with pitifully small air strength -- this policy paid. The Ju 87, known as the Stuka (dive bomber), achieved even greater success in *Blitzkrieg* warfare, operating as the spearhead of the army's armoured attack.

Deficiencies of the Luftwaffe

The Luftwaffe was, in fact, designed for mobility and intimately close support of ground forces: when the German army was finally confronted in the late summer of 1940 by the English Channel, the accompanying air force, though still on the offensive, was forced to fight a different war from static bases, against a highly trained enemy with equal morale and, at close quarters, devastating fire-power. The deficiencies of the Luftwaffe began to appear; not only the poor self-protection of its bombers, but also the lack of a clear policy in its command. Great damage was inflicted, especially by the night raiders of 1940-41, but this switching from day to night attack was in itself a confession that the Luftwaffe had been halted. Even the much publicised promotions of Goering to Reichsmarschall and of

Kesseling, Sperrle, and Milch to field marshal's rank now seemed premature. (*See Air Raids; Air Warfare; Britain, Battle of.*)

Germany's next attacking moves were in the Mediterranean theatre, and for two years a bitter and fluctuating struggle was waged in the desert, with the Luftwaffe always a potent factor. This was proved especially in the capture by the Germans of Corinth and Crete, 1941, when the twin techniques of dropping troops by parachute and of towing them in gliders to battle were triumphantly justified. (*See Airborne Forces; Crete in the Second Great War.*)

Failing Resources

It was Hitler's insistence on the invasion of Russia that broke the back of the Luftwaffe. With his factories still geared to the production of the same basic types of aircraft -- now supplemented, however, by the Focke-Wulf 190, a first-class fighter, the Me 110 and its derivatives, and the ubiquitous Ju 88 -- and training affected by the loss of fine leaders in action and the lack of all-round experience in large-scale static warfare, Germany could ill afford the turning of two-thirds of her entire first-line air strength on a new enemy. Moreover, although the dramatic entrance of Japan into the war provided Germany with an ally, that ally was unable to help directly, and a large U.S. air force was soon aiding the R.A.F. in harrying the Luftwaffe and its feeble shadow the Italian Regia Aeronautica.

The longest battle of the air war was in the Atlantic, with the Allied convoys being hunted and attacked by the Luftwaffe with bomb, machine-gun, and air-launched torpedo and mine. The four-engine Focke-Wulf 200 was a tremendous asset, but Germany lacked numbers in the heavy long-range class of bomber.

By Sept., 1943, the Allies were again astride the Mediterranean; and on and after D-Day (June 6, 1944), suffering from ceaseless attack, the Luftwaffe proved surprisingly helpless. The disappearance of the "air umbrella" lost Germany her defensive battles as surely as its presence had helped her in 1940.

Inventive ingenuity was far from dead in the final days of the Luftwaffe. The glider bomb found many a target in the war at sea. Most important, but too late to influence the course of the war, was the introduction of the jet-propelled aeroplane. Germany was first in this field, with the Me 262 and Arado 234 in service, while her rocket-propelled Me 163 was the fastest aircraft in any air force at that time. (*See Jet Propulsion.*)

The production programme was inevitably devoted to such defensive weapons, and Luftwaffe strategy was conditioned by the formation in 1941 of a huge home defence Fighter Command, at first numbering 3,000 first-line aircraft, then about half the total strength. In command was the veteran Gen. Stumpff, who had led the Luftwaffe in the campaign in Norway (1940). The Luftwaffe included throughout the war about 90 p.c. of the total *Flak* (A.A. defence) organization of the Reich, numbering about 1,000,000 men. This integration of anti-aircraft with the air service worked smoothly. (*Consult The German Air Force, A. Lee 1946.*)

G. D. H. Linton

Lug. In engineering, an extension or projection forming an integral part of an engineering structure, machine, or fitting. It serves as a means of attachment for another part and may be drilled for bolts, wires, etc. The name is perhaps derived from the colloquial or dialect word for ear.

Lugano (anc. *Ceresius Lacus*), Lake of Central Europe. It is partly in Italy and partly in Switzerland, being between lakes Maggiore and Como. Its length is about 22 m., its width 2 m., greatest depth 945 ft., alt. 899 ft., and area 20 sq. m. Of irregular shape, it is nearly surrounded by mountains, rising steeply from the lake; its W. arm is almost cut off by the promontory of Mt. Salvatore. The St. Gotthard rly. borders it and traverses it between Lugano and Capolago. Its waters are discharged by the river Tresa into Lake Maggiore. Between the villages of Bissono and Melide, S. of the town of Lugano, there is a fine bridge. A steamboat service was started on the lake in 1856.



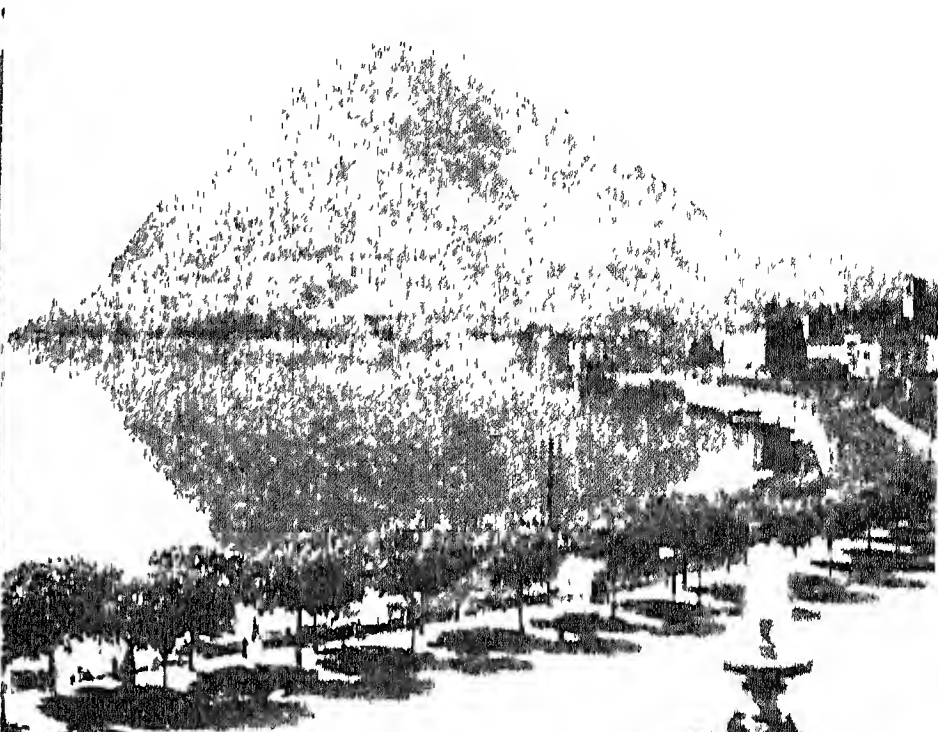
Lugano. View of the north end of the lake, near Porlezza

Lugano. City of Switzerland, in the canton of Ticino. On the N. shore of Lake Lugano, 15 m. by rly. S. of Bellinzona and 51 m. N. of Milan on the St. Gotthard line, it is the largest town in the canton, and was formerly one of its three capitals. Beautifully situated and sheltered by mountains, it is Italian in scenery, climate, architecture, and speech. Lugano has fine quays, theatre, picture gallery, and an English church. S. Lorenzo, a cathedral church, dates from the 15th century; the town is within the bishopric of Basel-Lugano.

ernor and c.-in-c. of both N. and S. Nigeria, he united the two in 1914 and governed for another five years. During 1922-36 he was on the League of Nations permanent mandates commission. Knighted in 1901, he was created a baron in 1928. His books include the *Rise of Our East African Empire*, 1893; *The Dual Mandate in British Tropical Africa*, 1922, in which he urged the necessity of governing through native rulers. Lugard died April 11, 1945, leaving no heir. *Consult* Life, M. Perham, vol. 1, 1956. His

Minho, 72 m. by rly. S.E. of Coimbrã. Its lofty, thick walls, with numerous towers, dating from about the 3rd century, were built by the Romans who also built bath houses for its celebrated sulphur springs. Lugo, seat of a bishopric, has a 12th century Gothic cathedral with a façade dating from the 18th. It makes leather articles. Pop. (1950) 53,743.

Lugo. Town of Italy. In the prov. of Ravenna, it is 36 m. by rly. E. of Bologna. It has a 15th century castle and holds an important fair in September. It



Lugano, Switzerland. Left, the town from S. Lorenzo. Right, lake front looking towards Monte San Salvatore

S. Maria degli Angioli has frescoes by Luini. Lugano became Swiss in 1512. In 1848 Mazzini made it his headquarters. It is a health resort and the centre of banking, trade, and industry in Italian Switzerland. Pop. (est.) 20,000.

Lugansk. Former name of the Russian city Voroshilovgrad (*q.v.*).

Lugard, FREDERICK JOHN DEALTRY LUGARD, BARON (1858-1945). A British administrator. Born Jan. 22, 1858, and educated at Rossall and Sandhurst, he joined the army and saw service in Afghanistan, the Sudan, and Burma; and in 1888 led a successful expedition against the Arab slave-traders in Nyasaland, being severely wounded. He then served under the British East Africa Co. which made him administrator of Uganda; later he commanded forces sent to Borgu and Lake Ngami. In 1897, as commissioner in W. Africa, he raised and commanded the W. African Frontier Force. He was governor and c.-in-c. Hong Kong 1907-12. Appointed Lord Lugard



Lord Lugard, British administrator

wife, Flora Shaw (*q.v.*, d. 1929) was sometime head of The Times colonial department.

Lugg or Lug. River of England and Wales. It rises in Radnorshire and flows through Herefordshire to the Wye, which it enters below Mordiford. Its tributaries include the Arrow and the Frome, and Leominster is on its bank.

Lugger. A craft carrying lug sails. Luggers may have one, two, or three masts. Sometimes they are also fitted with top sails. Owing to their extreme handiness luggers were formerly a favourite craft of the old-time Channel smugglers.

Lugnaquilla. Mountain of co. Wicklow, Irish Republic. It is 15 m. W. of Wicklow and attains an altitude of 3,039 ft., the highest summit in the county.

Lugo. Maritime prov. of N.W. Spain, bounded N. by the Bay of Biscay, and drained by the Minho. It is mountainous, and is particularly rich in copper, lead, granite, marble, and slate. An agricultural district, it yields cattle and farm produce, timber, and fibre, and contains many thriving towns. Area, 3,815 sq. m. Pop. (1950) 508,916.

Lugo (anc. Lucus Augusti). City of Spain, capital of the prov. of Lugo. It stands on the river

manufactures include rope and furniture, and there is a brisk trade in corn, wine and hemp. Pop. (1951) 31,219.

Lugos. A town of Rumania. It is situated on the Timis, where that river leaves the mts., at the W. end of the Transylvanian Alps, and is an important rly. junction on the route from Budapest to the Danube at Orsova. Wine is the chief product. Pop. (est.) 25,000.



Lugo, Spain. Façade of the 12th-century cathedral

Lug Sail. Fore and aft sail, with a spar along its upper side, carried across the mast. It is a common rig in boats, and easy to handle. A working lug can be let go at once to spill the wind. A dipping lug has to be lowered, or dipped, every time a tack is made. A balanced lug has a long, light boom, which makes it dangerous to use except in calm waters.

Lug Worm. Name often applied to the lob worm (*q.v.*). It is an annelid worm, living in burrows between the tide-marks along the seashore.

Luini, BERNARDINO (c. 1470-c. 1535). Italian painter. Born at Luino, Lake Maggiore, he studied under Stefano Scotti, but later adopted the style of Leonardo da Vinci (*q.v.*). His religious compositions are always tender and sometimes sickly; he lacked the virility of his great master. His best frescoes are the Life of the Virgin series in the Pilgrimage Church, Saronno, and there are others at Milan. Among his easel-pictures are several in the National Gallery, London, and many in continental galleries.

Luke (Gr. *Loukas*; Lat. *Lucanus*). One of the four evangelists. He is believed to have been a physician of Antioch, one of the early members of the Church of Antioch, and author of the third Gospel and of the Acts of the Apostles. A follower of Paul and his companion in his missionary journeys, he is said to have died or to have been martyred in Bithynia at the age of 74. According to tradition he was a painter, several pictures of the Virgin are ascribed to him, and he is regarded as patron saint of the fine arts. In ecclesiastical art he is represented by the ox, often winged, a symbol of sacrifice and priesthood. His festival is Oct. 18. *See* Acts.

Luke, THE GOSPEL OF. The traditional view which ascribes the authorship to Luke, the companion of S. Paul and the beloved physician, is accepted by many modern scholars, mainly on the ground that it is the theory which most satisfactorily explains the critical data of Acts.

The Gospel is dedicated to Theophilus, who was possibly a high Roman official, but there is little doubt that it was intended for the use of the Church as a whole, and especially for Gentile readers. Luke, as he tells us in the preface, obtained his information from eye-witnesses of the facts, and from written accounts. It is clear that he used Mark and the Logia (*q.v.*).

It is held by many that the section L. v. 5 to 2, v. 52 is derived from the Virgin Mary. The Gospel, however, is not merely a compilation from earlier sources. It bears in a marked degree the impress of the writer's own personality. It shows, more clearly than any other of the Gospels, the universal scope of the teaching of Jesus. The horizon of Matthew and Mark is bounded by the confines of Palestine. The horizon of Luke stretches out to the limits of the Roman empire. Luke always exhibits an intense interest in the social aspects of the teaching of Jesus. The Gospel has often been called the Gospel of the poor and the outcast, because it lays special stress on the relations of Jesus with them. From the historical point of view its most interesting feature is the space which it devotes (nine chapters) to the narrative of the events connected with the last journey of Jesus to Jerusalem. Another remarkable characteristic of the book is the prominence which it gives to the work of women. *See* Gospels, the Four.

Luke, GEORGE LAWSON JOHNSTON, 1ST BARON (1873-1943). British industrialist and philanthropist. Born Sept. 9, 1873, and educated in Canada and Scotland, he travelled in Argentina and British dominions before returning in 1906 to join the board of Bovril, Ltd., which his father had founded, and of which he later became chairman. Johnston was on the council of the London chamber of commerce, and chairman of the national committee of the international chambers of commerce. A great benefactor of voluntary hospitals, he was chairman, 1922, of the committee which organized a combined appeal; also chairman of the British charities association, treasurer of the London Red Cross, and vice-president of the British and Foreign Bible Society. In 1936 he introduced in the house of lords a bill dealing with paying patients in voluntary hospitals. Knighted in 1920, he was raised to the peerage in 1929; his title was said to be taken from S. Luke, the patron saint of physicians. Lord Luke died Sept. 23, 1943, and the title went to his son, Ian St. John Lawson Johnston. Born June 7, 1905, and educated at Eton and Trinity College, Cambridge, he succeeded his father as chairman of Bovril Ltd.

Lukin, LIONEL (1742-1834). British inventor of lifeboats. He was for many years a fashionable London coachbuilder in Long Acre,

and later (1785) he obtained a patent for an unsinkable boat. In 1790 he published a description of his lifeboat with illustrations drawn to scale. Among his other inventions was a raft for rescuing people from under ice, an adjustable bed for invalids, and a rain-gauge. He died Feb. 16, 1834. *See* Lifeboat.

Lukmanier Pass. Mountain route in Switzerland, between the cantons of Grisons and Ticino. It is part of the carriage road from Disentis to Olivone and Biasca, on the St. Gotthard rly. Alt. 6,290 ft.

Lukuga. River of Africa. Flowing from Lake Tanganyika to the Congo, it forms an outlet for the surplus waters of the lake, but is not navigable. A rly. has been built along the Lukuga valley, from Albertville on the lake to Kabalo on the Lualaba.

Luleå. River of N. Sweden, in the govt. or län of Norrbotten. It issues from a lake at the foot of the Kjölen Mts., flows S.E., and discharges into the Gulf of Bothnia at Luleå. There is a fine waterfall in its upper reach. The length of the river is about 250 m.

Luleå. Seaport of Sweden, in the govt. or län of Norrbotten. It stands at the entrance of the Luleå into the Gulf of Bothnia, 58 m. W.S.W. of Haparanda, and is connected by rly. with Gellivare and Narvik in Norway. It has a good, well-equipped harbour. Among the principal exports are Gellivare iron ore, timber, tar, reindeer hides, and salmon. Most of the iron ore from Luleå went to Germany, to whom it became of special importance on the outbreak of the Second Great War. It was sent by rail to Narvik, and thence by sea; the British action in mining the Norwegian territorial waters around Narvik, so as to force the iron-ore boats into the open sea where they could be attacked by naval patrols, was cited by Germany as a factor justifying her invasion of Norway in 1940. Pop. 15,208.

Lule Burgas or **BURGOS.** Town of European Turkey. On the Karagach, it is about 35 m. S.E. of Adrianople (Édirne), and lies on the Sofia-Istanbul rly. It is a commercial centre. A battle was fought there Oct. 28-Nov. 2, 1912, between the Bulgarians and the Turks in the First Balkan War. The Bulgarians attacked on a 25-mile front from the Ereğene to Bunar Hissar, and after two days' fighting with fluctuating fortunes forced their way into Lule Burgas on Oct. 31. The Turkish army, cut in two, broke off the fight and retired; but

the Bulgars, who had lost 15,000 men from wounds and sickness, were too exhausted to pursue them.

Lull, RAMON. A Spanish mystic whose name is anglicised as Raymond Lully (*q.v.*).

Lully or LULLI, JEAN BAPTISTE (1632-87). A French composer. Born at Florence, Nov. 29, 1632



J. B. Lully,
French composer

(the year has been disputed). Lully went to France as a child and became a naturalised Frenchman in 1661. He entered the service of Louis XIV as a violinist, and later was made conductor of the king's orchestra, given charge of the opera, made music master to the royal family, and honoured with a title of nobility. He composed in 1672 *Les Fêtes de l'Amour et de Bacchus*, which marks the beginning of French opera, following up this with about 20 operas. Molière collaborated with him in about 20 ballets written for the court. He died in Paris, March 22, 1687.

Lully, RAYMOND (1235-1315). Spanish philosopher and missionary. Also known as Ramon Lull, he was born at Palma, Majorca, of a noble and wealthy family, became a prominent figure at the court of Aragon, and achieved repute as a poet and man of the world. In 1265 he resolved to devote himself to the conversion of the Saracens. Believing that the truth of Christianity could be demonstrated by reason he devised the so-called Lullian method, for the solution of all problems, aided by a mechanical contrivance. He also acquired proficiency in Oriental languages, for the study of which he established chairs at Paris, Oxford, and Salamanca.

After journeys in Asia and Africa, on the occasion of a third missionary visit to Tunis, where he preached against Islam, he was stranded and left on the seashore, whence he was rescued by a sea-captain, but died on board ship, June 30, 1315. His voluminous works include *Ars Magna*, descriptive of his method for the acquisi-



Raymond Lully,
Spanish philosopher

tion of knowledge, and two books against Averroes and the Averroists. He was known as the enlightened doctor, and much of his teaching was remarkably liberal for his age. His followers combined mysticism with alchemy. *Consult Raymond Lull und die Anfänge der Catalonischen Literatur*, A. Helfferich, 1858; *Fool of Love*, E. A. Peers, 1947.

Lulworth. Two villages of Dorset, England. West Lulworth lies on the coast 8 m. S.W. of Wareham, and near it is Lulworth Cove, a circular bay about 500 yds. across and almost enclosed by hills. Here Keats wrote his last sonnet before finally leaving England. Along the cliff may be traced a fossil forest. At East Lulworth, inland and 3 m. away, is a 16th century castle. During the Second Great War Lulworth was a training ground for the Royal Armoured Corps. Pop. 1,368.

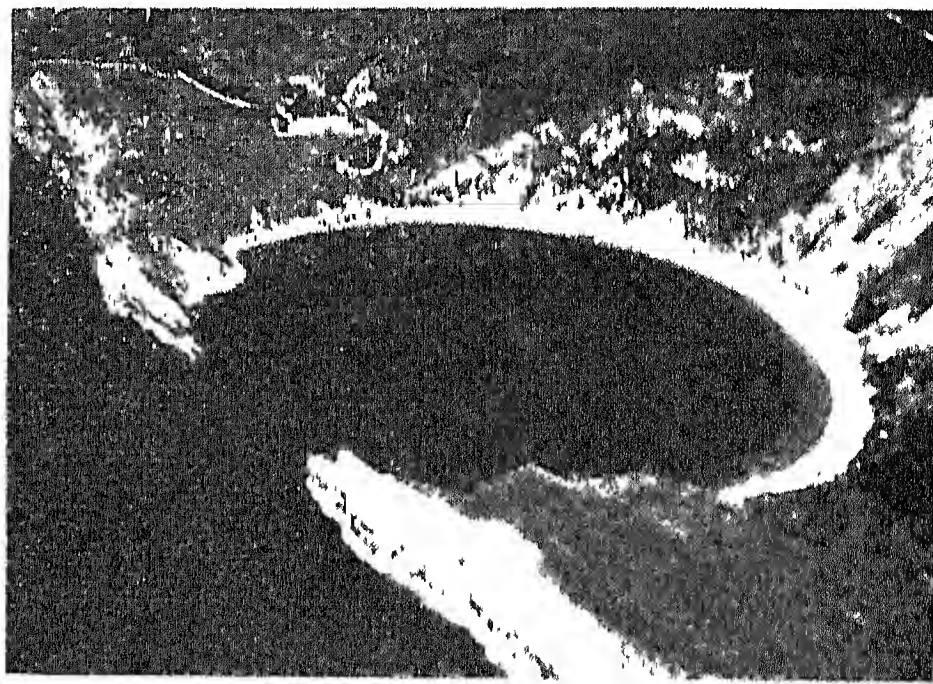
Lumbago (Lat. *lumbus*, loin). Painful affection of the muscles of the loins and their tendons, due to inflammatory changes in the fibrous tissue or fascia which surrounds the muscles. The affection may follow a strain in lifting weights and is often associated, in a way not understood, with nervous strain or fatigue. Exposure to cold and wet is a frequent exciting cause. The pain comes on suddenly, and the patient often rises from bed or from a sitting posture with great difficulty. Rest of the muscles is an important part of the treatment. The back should be protected from cold, and the application of heat and counter-irritants, or of short wave or infra-red rays, may result in sudden cure. Injections of cocaine or its derivatives into the local sensory nerves often give dramatic relief.

Lumbar Puncture. A procedure now common in the diagnosis and treatment of many diseases, especially those affecting the nervous system. It consists essentially of puncturing the spinal canal with a hollow needle, inserted between the third and fourth lumbar vertebrae slightly to one side of the midline. The exact position of the patient, and the exact method of withdrawing fluid, vary with the technique of the individual surgeon.

Diagnosis is aided by the presence of cells, bacteria, altered appearance of the fluid, or altered pressure; and treatment is aided by the possibility of introducing drugs or sera directly into the spinal canal or of lowering pressure by mechanical removal of fluid.

Anaesthesia is frequently induced by this means, the patient remaining conscious but feeling no pain during operation.

Lumber. Timber sawn and split for use in the form of beams, boards, joists, etc. The term originated in America, where the



Lulworth Cove, Dorset. Bay, very nearly land-locked, which was once a favourite haunt of smugglers

fellings of timber and its transport was first begun on a large scale, this being called lumbering. On the E. seaboard, the industry in the U.S.A. and Canada gives winter employment to thousands of hands who work in summer and autumn on the farms. On the Pacific coast, owing to climatic differences, it is an all-the-year-round occupation, and forest practice, more highly mechanised than in the E., is carried on by means of logging railways and trucks which carry the logs to the water, where they are towed to their destination.

In the E., lumbering gangs begin work in the late autumn and the fellers work in pairs, one on each side of the tree. The trees are partly cut down with axes and partly by saws, hand or power driven. The felled and trimmed trees are hauled to the bank of the nearest stream and there usually sawn into lengths of from 12 to 20 ft. The logs are piled up by the river in readiness for the thaw, and when the ice melts and the river begins to flood, the logs are floated down the stream to the sawmills. All the logs, before being sent to the mills, are measured by scalers, who estimate the quantity of usable timber in each log. The operation of sending the logs down the river is one which requires much skill,

as there may occur a log jam. Such jams may hold up the river, and they can be prevented or cleared only by men who carry long steel-pointed poles, and keep the logs moving. Where the river admits of it, the logs are bound together by ropes or chains into large rafts. Some of these rafts, floated down the St. Lawrence, for example, are several acres in extent, and the lumber men in charge live on them for days at a time. At the saw-mills the rafts are broken up, sawn into beams and planks, and stacked to dry for export. *See* Forestry; Timber.

Lumen. Unit of luminous flux. It is the luminous flux emitted in unit solid angle by a point source of one international candle, *i.e.* the flux passing through unit area of a sphere of unit radius with its centre at the source. It is not possible to assign a definite mechanical equivalent, but at the wavelength (5,560 Å) of maximum eye sensitivity 621 lumens equal 1 watt. The density of flux received on a surface is a measure of the illumination (*q.v.*), the unit of which is the lux (1 lm. persq. metre).

Lumière. Name of two French brothers, Auguste Marie Louis Nicholas (1862-1954) and Louis Jean (1864-1948), joint inventors of the cinematograph, a primitive moving-picture machine. Working as photographic manufacturers in Lyons, the brothers patented their projector in 1895, giving their first public film show in Paris in Dec. An exhibition of moving pictures made by the younger Lumière, at the London Polytechnic on Feb. 20, 1896, was the first display in public in England. Forty years later this programme was repeated at the Polytechnic with the original projector. *See also* Colour Photography, page 2249, col. 1.

Luminescence. Light emitted otherwise than as the result of heating or incandescence. It appears in several forms, *e.g.* fluorescence and phosphorescence, described under their respective headings, and in the light emitted by a number of animals and insects. Many solid substances re-emit light after illumination; the effect is generally feeble and of short duration, but is more intense at low temperatures such as the b.p. of oxygen or nitrogen. With some substances luminescence is shown by a substance in the pure state, with others only when they contain impurities. The luminescence of animals and insects, at one time confounded with phosphorescence, has nothing to do with the presence

of phosphorus in their tissues, but the exact cause has not yet been satisfactorily explained. Light is emitted by many deep sea fishes, *e.g.* the lantern fish; surface sea animals like jellyfish; glow worms, flies, etc. Such light is practically devoid of heat rays. *See* Firefly; Glow-worm.

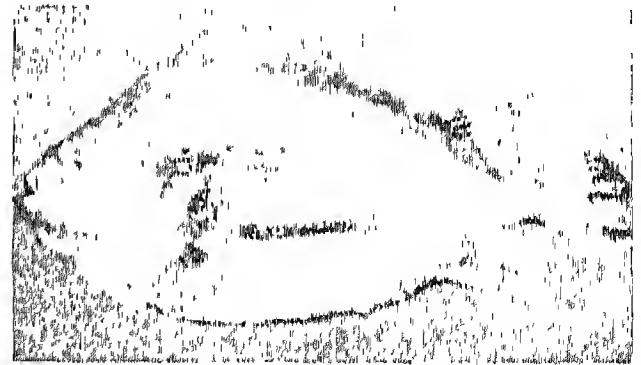
Luminosity. Term in physics. The luminosity or brightness of a surface is measured by the amount of light emitted per unit area. The lambert is the unit of luminosity and corresponds to the emission of 1 lumen (*q.v.*) from one sq. cm. of surface. Alternatively the brightness of a surface may be expressed as candle-power per unit area. The milli-lambert, *i.e.* 10^{-3} lambert, is the most useful unit; the luminosity of objects in sunlight is about 1 lambert, while indoor brightness may be between one and ten milli-lamberts. The luminosity of a high-current density carbon arc is about 60,000 and in contrast that of a glow-worm about 0.005. To measure the luminosity of a colour, a standard or unit of luminosity has to be fixed, and two cases have to be considered, the first when coloured lights are being evaluated, and the second when dealing with the colours seen when pigments are illuminated by white light. With coloured lights, the unit taken is some of the white light produced by the source which gives the coloured light. With pigments, it is the luminosity of a white surface illuminated by the same light.

The luminosity of a body is, in general, caused by its being so hot as to become incandescent, and the temperature at which bodies become luminous varies considerably. The luminosity of many flames is due chiefly to the incandescence of the carbon particles released by the chemical decomposition of the combustible gases. *See* Flame; Photometry.

Luminous Night Clouds. Clouds occurring at heights which have been determined photographically to be approximately 50 miles above the earth's surface. They have been seen at intervals in both hemispheres, about midnight, particularly just after the summer solstice. They show bluish-yellow coloration and most frequently move from the N.E. with velocities up to 300 m.p.h. *See* Cloud.

Lumphanan. Village of Aberdeenshire, Scotland, about 8 m. S. of Alford and served by rly. from Aberdeen. Here on Aug. 15, 1057, Macbeth was slain in battle by Malcolm Canmore, a cairn marking the supposed spot.

Lumpsucker (*Cyclopterus lumpus*). A family of short, thick fishes. They are found around the



Lumpsucker. Specimen of the species found on British coasts

coasts of the northern seas, one species being common in British waters. On the chest these fishes have an adhesive disk by which they attach themselves to the rocks. They are usually about a foot in length, and feed upon the young of other fishes, crustaceans, etc. The males have bright red and yellow sides, and are able to modify their colour to match their surroundings. It is they that watch over the eggs during the breeding season.

Lumsden, Sir Harry Burnett (1821-96). British soldier. Son of a colonel of the Bengal Artillery, he was born Nov. 12, 1821, and educated in England. In 1837 he entered the service of the East India Co., and in 1838 obtained a commission in the Bengal army. In 1842 he served as an interpreter in Afghanistan. After experience of border warfare, he was given the task of raising the corps of guides, with which his name is chiefly associated. He led the corps in the war against the Sikhs, and in several campaigns on the frontier, although not continuously in command. He retired in 1875, and died Aug. 12, 1896. *See* Guides.

Lunacy (Lat. *luna*, the moon). Term equivalent to insanity (*q.v.*), since it had long been recognized that some forms of mental illness are influenced by the phases of the moon. The lunacy laws deal with the care of the mentally ill.

Lunacy Commissioners. Officials who formerly supervised the administration of laws relating to the insane. They were nominated and removable by the lord chancellor. By the Mental Treatment Act, 1930, their functions were transferred to the board of control. *See* Insanity.

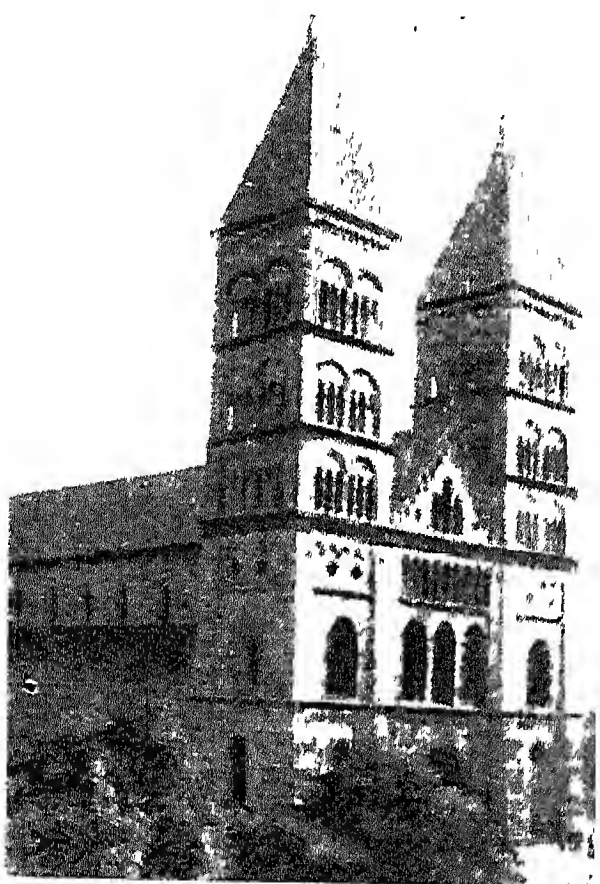
Lunar Caustic OR SILVER NITRATE. Crystalline salt used as a caustic to destroy warts, exuberant granulations, etc. It is usually put up in the form of sticks, the thickness of a slate pencil. The name is due to the use in alchemy of Lat. *luna*, the moon, for silver.

Lunar Cycle. Period of 235 lunations, which is almost exactly equal to 19 solar years. Discovered c. 432 B.C. by a Greek astronomer Meton, and sometimes called therefore the Metonic cycle, it differs by $1\frac{1}{2}$ hours from 19 Julian years.

Lunardi, Vincenzo (1759-1806). Italian aeronaut. Born at Lucca, Jan. 11, 1759, he was attached to the Neapolitan embassy in London. He studied aerostatics, and constructing a balloon with a circumference of 33 ft., which he filled with hydrogen, he made an ascent from Moorfields, Sept. 15, 1784. After a journey of $2\frac{1}{2}$ hours he descended at Ware. The balloon was furnished with oars, which proved useless. Lunardi later made ascents from Edinburgh and Glasgow. He died July 31, 1806.

Lunar Month. Period during which the moon goes through a complete sequence of its phases, i.e. from new moon to new moon. Its average period is 29 days, 12 hours, 44 minutes, 2.8 seconds.

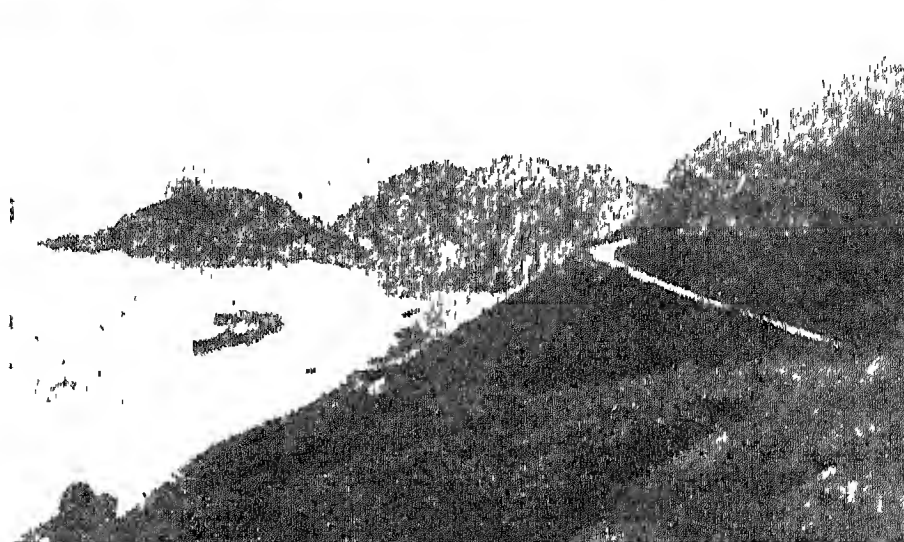
Lund. City of Sweden. In the län or co. of Malmö, it is 13 m. N.E. of Malmö. The chief building is the large and noble Roman-



Lund, Sweden. Western front of the Romanesque cathedral

esque cathedral, consecrated in 1145. The university is a noted institution; connected with it are an observatory, botanical gardens, etc. Industries include sugar refining and furniture making. Pop. (1956) 36,920.

Lund was an important place in the 10th century or earlier. About 1050 it was made the seat of a bishopric; during 1163-1536 it was the seat of an archbishopric, the head of which was primate of Scandinavia. Lund, said to have



Lundy Island, Bristol Channel. Harbour and landing place on south-eastern shore

been the largest town in Scandinavia in the Middle Ages, was a seaport in early times, but the sea has receded. In 1676 Charles XI of Sweden defeated the Danes here, and the peace which followed is called the treaty of Lund.

Lunda. Country of W. central Africa, divided between the Belgian Congo and Angola. The Portuguese portion forms one of the districts into which Angola is divided; it is in the N.E. Most of Lunda is drained by a series of more or less parallel streams, tributaries or sub-tributaries of the Congo.

Lundholm, Carl Olaf (1850-1934). Swedish-born British chemist. A native of Stockholm, while still studying he took a special interest in explosives. In 1878 he met Alfred Nobel in Paris, and in the same year went to Scotland for Nobel's Explosives (afterwards I.C.I. Ltd.). He designed the fulminate factory erected in Stirlingshire, 1879-80, and was appointed its assistant manager; later he was made manager of the Ardeer factory, Ayrshire, where for many years he greatly stimulated research, experiment, and discovery. One of the most courageous and successful pioneers of explosives research, he was technical adviser to the Nobel Trust 1909-14. Lund was naturalised as a British subject in 1890, and died in London on May 8, 1934.

Lundy (O.N., grove island) OR PUFFIN I. Small island off the N. coast of Devon, England. It is 12 m. N.N.W. of Hartland Point. Almost entirely surrounded by cliffs, the island was at one time the resort of pirates, and possesses many antiquities

including the remains of Marisco Castle and round towers. From granite quarried here part of the Thames Embankment was constructed. On the island is a light house called popularly Laundry Light. The island was owned during 1836-1916 by the Heaven family;

1917-25 by A. L. Christie; by Martin Cohen Harman (1885-1951) from 1925. It was long the h.q. of the family of Marisco, famous for their piracies. It is 2 m. long and about $\frac{1}{2}$ m. wide; area, 1,047 acres. Lundy coins called puffins, issued by the owner, were withdrawn in 1927 as not being legal tender. *Consalt* Lundy, Isle of Puffins, R. Perry, 3rd ed. 1916.

Lundy's Lane. Village of Ontario, Canada, 11 m. from Niagara Falls. An engagement of the American War of 1812-14 was fought near here, July 26, 1814. An American force of c. 2,600, under Gen. Jacob Brown (1775-1828), had invaded Canada. It was met by an army 3,000 strong of British regulars and Canadian militia, under Sir Gordon Drummond. The battle that followed was indecisive, but the Americans fell back on Fort Erie, were besieged there for two months, and left Canadian soil in Nov. British losses at Lundy's Lane were 878 (84 killed, 569 wounded), American 853 (171 killed, 572 wounded).

Lune. River of England. It rises in the S.E. of Westmorland and flows S. and S.W. for 45 m. to Lancaster Bay. Near its mouth is Glasson, port of Lancaster.

Lüneburg. Town of Lower Saxony, W. Germany, 33 m. by



Lüneburg, Germany. Market place and town hall

ry, S.E. of Hamburg. It retains in its old buildings many signs of its former greatness. The town hall consists of a group of buildings dating from the 13th to the 18th century, and contains the magnificent princes' hall (Fürstensaal). The most notable churches are those of S. Nicholas, an imitation of S. Mary's at Lübeck, and dating from the early 15th century; the Gothic church of S. John, with a 350 ft. tower and double aisles; and S. Michael's (1418). Other buildings are the merchants' hall and the old palace of the dukes. There are remains of the town walls and a number of old houses; also a large library, a museum, and other modern edifices. The salt deposits have been worked since the 10th century, and limestone and gypsum quarrying are also old industries. Manufactures include iron goods, cement, chemicals, etc. To the S. of the town are saline springs and baths. Mentioned in the time of Charlemagne, Lüneburg was an important member of the Hanseatic League in the Middle Ages. Near it took place the first fighting in the war of liberation, April 2, 1813. Pop. 29,000.

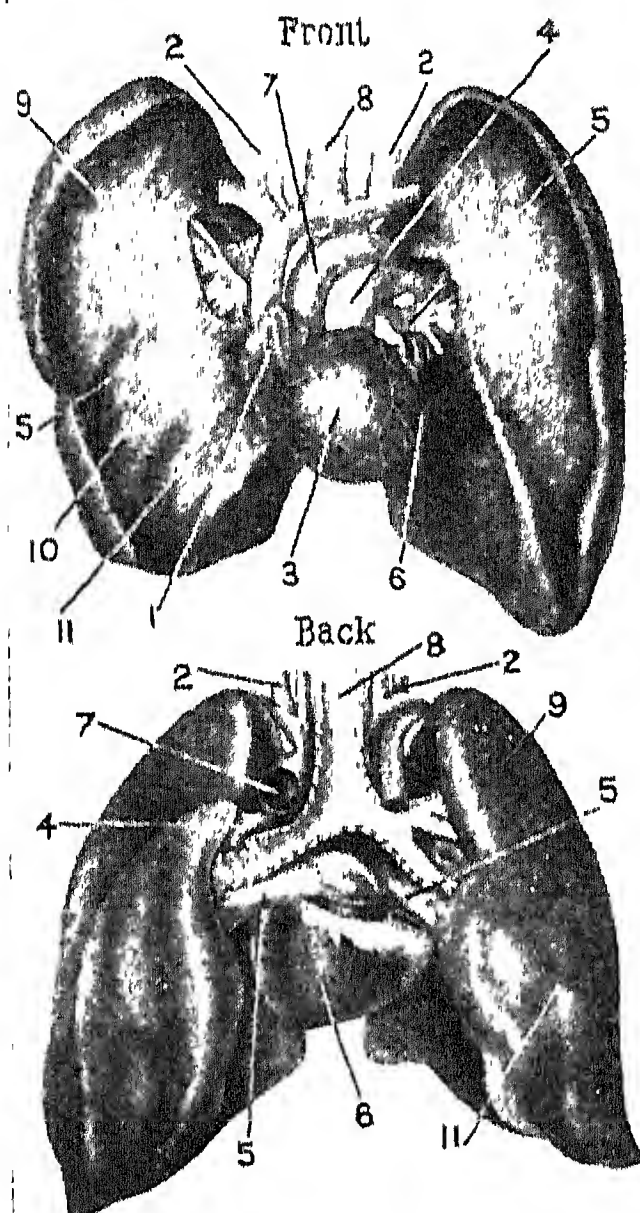
At a point on Lüneburg Heath, S. of the town, F.-M. Montgomery on May 4, 1945, received the surrender of all German armed forces in the Netherlands, N.W. Germany, Slesvig-Holstein, and Denmark, amounting to more than a million men. This virtually marked the close of Great Britain's European campaign in the Second Great War, and Lüneburg served for a time as main h.q. of the British forces. The site of the surrender is marked by a memorial. (See Montgomery, Viscount.)

The little duchy of Brunswick-Lüneburg, of which Lüneburg was the capital, was an offshoot of the duchy of Brunswick. It existed from 1235 to 1369. Later it was made into a separate principality for junior members of the family ruling over Brunswick. See Brunswick; Hanover.

Lunenbourg. Town and seaport of Nova Scotia, Canada. It is 70 m. S.W. of Halifax, with a station on the C.N.R. It has a good harbour (22 ft. at low water), and the chief industry is fishing; there is also a cold storage plant. Pop. 2,856.

Lunette (Fr., little moon). Term in architecture denoting a round or oval window in a ceiling, flat or domed. As a method of lighting a dome it was used as an alternative to the lantern (*q.v.*) or cupola (*q.v.*), the chief drawback to such

use being that it broke the line of the curve. The term is also applied to a picture enclosed by an architectural circular or oval frame in the ceiling of a building.



Lung. Front and back views of the organ. 1. Right auricle. 2. Internal jugular veins. 3. Right ventricle. 4. Pulmonary arteries. 5. Pulmonary veins. 6. Left ventricle. 7. Aorta. 8. Trachea. 9. Upper lobe; 10. middle lobe; 11. lower lobe, right lung

Lunéville. Town of France, in the dept. of Meurthe-et-Moselle. It lies on the Meurthe, near its junction with the Vezouze, 20 m. by rly. E.S.E. of Nancy. It is the capital of an arrondissement and an important military centre, with large barracks. Now chiefly industrial, Lunéville has large rly. and motor engineering shops, industries in spinning, glove-making, tanning, and pottery, and trade in the agricultural produce of the district. The massive château, built by Duke Leopold I of Lorraine, 1703-06, and the 18th cent. church of S. Jacques are noteworthy features of the town, which was probably a Roman settlement known as Lunæ Villa and became part of Lorraine in the 14th cent. It was a residence of the dukes of Lorraine from 1702 to 1737 and passed with the duchy to France in 1766. It was occupied by the Germans, Aug. 24 Sept. 11, 1914, and again in 1940. U.S. forces liberated it Sept. 16, 1944, without serious German opposition. Pop. (1954) 22,690.

Lunéville, Treaty of. Peace made in 1801 between France and Austria. Napoleon's victories of Marengo and Hohenlinden forced Francis of Austria to ask for peace. By this treaty, signed Feb. 9, 1801, the Cisalpine, Ligurian, and Helvetic republics were recognized, and the Rhine was fixed as the boundary of France. It made France the dominant power in Italy, where Naples deserted Great Britain and made peace.

Lung. The organ of respiration. In man the two lungs occupy a bony cage, the thorax, which is bounded by the ribs laterally, by the spine at the back, and by the sternum, or breastbone, in front. They occupy almost the whole cage, which contains also the heart, the great blood vessels that enter and leave it, the trachea or breathing-tube, and the oesophagus, which is the first part of the alimentary tract. Each lung is cone-shaped, with the base resting on the diaphragm, the most important muscle in respiration. The apex of the cone extends upwards into the root of the neck, behind and above the collar-bone.

The root of the lung, or hilum, is fixed, in that it contains one division of the trachea, which there divides into its two main branches, the right and left bronchi. At this point also the main arteries and veins of the lung pass between it and the heart. Thus the root of the right lung contains the right pulmonary artery, which conveys venous blood from the right ventricle of the heart, and two pulmonary veins which bring back to the left auricle the arterial blood to be distributed to the body through the aorta and its divisions. Of this arterial blood the lung gets its share from the bronchial arteries which accompany the subdivisions of the main bronchus throughout the organ.

Each lung has round it a fine serous membrane, the pleura, which is in two layers. The inner, or visceral, layer is closely applied to the lung; it reflects at the root to form a second or parietal layer, which lines the inner surface of the thorax. The result is an interpleural space in which the lung can move freely on respiration. Movement is aided by the negative or sub-atmospheric pressure which exists in the space, and therefore does not oppose expansion of the lung by inspired air at atmospheric pressure.

The right lung is the larger and has three main parts called lobes;

the left has two lobes. These lobes are divided into several lobules, each about a quarter of an inch long. A lobule is also cone-shaped, its apex being at the point of entry of its supplying air-tube called a terminal bronchiole. Each lobule is made up of bunches of alveoli or air-cells; their very thin walls consist of elastic tissue containing the finest divisions of the pulmonary artery. It is through the air-cells that the lung fulfils its function of bringing about gaseous interchange. Oxygen in the inhaled air is brought into contact with the venous blood in the final subdivisions of the pulmonary artery. This venous blood contains carbon dioxide, the waste product formed in the metabolism of the body. The oxygenated blood which results becomes arterial blood, and is returned to the heart by the pulmonary veins, while the carbon dioxide is exhaled from the lung.

Lung-fish OR BARRAMUNDA. Fish of Queensland, Australia. It has the power of breathing air directly, as well as of extracting oxygen from water by gills, and is said to attain a length of about 6 ft. and a weight of 20 lb. Usually it is about half this size. The scales are remarkably large and the fins resemble fringed paddles. It lives in the mud, rising from time to time to the surface to take in air, and appears to live on a mixed diet, cropping aquatic plants and eating small creatures found among them. In the dry season, when the streams become small pools consisting mainly of mud and rotting vegetation, its ability to breathe air enables it to survive conditions which prove fatal to other fish.

Lungs of Oak OR TREE LUNGWORT (*Lobaria pulmonaria*). Large lichen. It grows chiefly upon the bark of old trees, particularly the

oak. It is brownish, and the margins are deeply lobed. The depressions and net-like markings of the under surface suggested a resemblance to the lungs, so under the doctrine of signatures it was established as a remedy for pulmonary troubles, and the herb-doctors continue today to prescribe it as such. It is one of the Crotches, and its real value is to the dyer; it is used to dye yarn and woollen goods.

Lungwort OR JERUSALEM COWSLIP (*Pulmonaria angustifolia*). Perennial herb of the family



Lungwort. Leaves and flower clusters

Boraginaceae, native to Europe. It has a stout creeping rootstock, and lance-shaped leaves which are often spotted with pale green. The funnel-shaped flowers are at first pink, then turn blue, and are clustered at the ends of the bristly branches. The garden plant

of the same folk-name is *P. officinalis*, with broader leaves, always spotted, and pale purple flowers.

Luni. A river of India, in Rajasthan. It rises in the Aravali Hills, and flows generally S.W. to the Rann of Cutch, along the S.E. edge of the Thar desert. Its main affluents, of which the Sukri is the longest, reach the left bank from the Abu mt. ridge. The whole of this river system is usually dry except during and immediately after the infrequent rains.

Lunn, Sir Henry Simpson (1859-1939). British travel organizer. Born at Horncastle, July 30, 1859, and educated at Dublin University, he went to India in 1887 as a Wesleyan medical missionary. Returning in ill-health the following year, he took a leading part in the West London Mission, edited the Review of the Churches, 1891-96, and founded the Grindelwald conferences, 1892-96, out of which grew his travel organization. His published works included Chapters From My Life, 1918; Secrets of the Saints, 1933; Nearing Harbour (autobiography), 1934. He died March 18, 1939.

Sir Henry's elder son Arnold (b. 1888) was president at different times of the Ski Club of Great Britain and other skiing and

mountaineering clubs, and wrote entertainingly on winter sports and travel in Switzerland and Italy. His other books included The Harrovians, 1913; The Flight from Reason, 1930; The Good Gorilla, 1943, and an autobiography, 1940. He was knighted in 1952.

Sir Henry's younger son Hugh Kingsmill (1889-1949) achieved success (under the name Hugh Kingsmill) as a journalist and literary critic, and the biographer of Matthew Arnold, Frank Harris, Samuel Johnson, and others.

Lunn, (Louise) Kirkby (1873-1930). British singer. Born in Manchester, Nov. 8, 1873, she studied at the R.C.M., London, and made her debut in Schumann's Genoveva at Drury Lane, 1893. She sang Nora in Shamus O'Brien, 1896. Her voice, of contralto quality, had an extensive range; and her success was confirmed by performances as principal contralto with the Carl Rosa Co., 1897-99. During 1901-11 she sang each season at Covent Garden, and was a favourite in Aida and Parsifal at the Metropolitan, New York. She died Feb. 17, 1930.

Lunt, Alfred (b. 1893). American actor, born at Milwaukee, Aug. 19, 1893. He made his stage debut at Boston in 1913 and scored a success in Clarence, 1919-21. In London he was known for witty and polished performances with his wife,

Lynn Fontanne (*q.v.*). The first was Caprice, 1929. Other successes of "the Lunts" were Reunion in Vienna; Idiots' Delight; Amphitryon 38; There Shall Be No Night; Love in Idle-ness; Quadrille.



Alfred Lunt, American actor

Lunula (Lat., little moon). Crescent-shaped gold ornament. It is undecided whether lunulae were worn on the hair or the neck. The edges and horns were generally punched or engraved with chevron patterns. Of the 83 examples known 64 were found in Ireland, 4 in Cornwall, 4 in Scotland, 6 in France, 2 in Denmark, 1 each in Wales, Belgium, and Hanover. At Newtown, co. Cavan, one was found in its oak case. Lunulae mark the channels of trade with early Bronze Age Ireland, the alien finds having come from the vicinity of ancient harbours. The word



Lungs of Oak. Specimen of the large lichen which grows on tree trunks

denotes also an ivory crescent worn upon the leather boot (*calceus*) of senators in ancient Rome.

Lupercalia. Ancient Roman festival. It was held in honour of the god Lupercus, on Feb. 15. It was originally pastoral and centred round the idea of the fruitfulness of the earth and of nature. After sacrificing animals to the god at his altar on the Palatine, the priests cut leather thongs, called *februa*, from their skins, and as they passed through the streets the women crowded round to be struck by these thongs, in the belief that their fecundity would thereby be promoted. This festival is referred to in Shakespeare's *Julius Caesar*. See February.

Lupescu, MAGDA (b. 1900). Second wife of Carol II (*q.v.*) of Rumania. A native of Jassy, she was the daughter of a Jewish apothecary named Wolff, and first married an army officer. She met Prince Carol in 1923; he gave up his claim to the throne, and lived with her in Paris, where she stayed when he assumed the crown in 1930. Both divorced, they joined again when he left Rumania in the Second Great War, and lived in Lisbon, Mexico, Brazil, and again Portugal. In 1947 they were married. A religious ceremony was performed, 1949. Mne. Lupescu took the title princess and the name Helena. She exercised a wise influence upon the king.

Lupin. Genus of leguminous plants (*Lupinus*), cultivated for their flowers. They are hardy and half-hardy annuals and perennials, natives of America and S. Europe, ranging in height from 6 ins. to 5ft., and bearing white, yellow, pink, or blue flowers. They should be planted in autumn in rich soil, and the half-hardy, subshrubby kinds need the protection of a layer of litter in winter. The annual sorts should be treated as ordinary annual plants.

Lupin, ARSÈNE. Central figure in a series of detective novels by

the French author, Maurice Leblanc (*q.v.*). Among the rather extravagant adventures of the "gentleman crook" was one in which he crossed swords with Sherlock Holmes. He figured in *A.L., Gentleman Cambrioleur*; *A.L. contre Sherlock Holmes*; *Le Bonchon de Cristal*; *Les Trois Crimes d'A.L.*; *La Demoiselle aux Yeux Verts*.

Lupino. Name of a British theatrical family. It traces descent from George Lupino, of an hereditary Italian family of puppet players who migrated to England at the beginning of the 17th century. Numerous Lupinos won fame as acrobatic dancers and music hall artists. George (1853-1932), a dancer, married Florence Webster (1860-99), and their most famous son was Stanley (1894-1942), actor and dancer. Born May 15, 1894, he appeared in Lyceum pantomime, 1910, and in numerous revues and musical comedies in London and New York. His reminiscences, *From the Stocks to the Stage*, appeared in 1934. He died June 10, 1942.

His brother Barry, comedian and dancer (b. Jan. 7, 1884), became a star of London and provincial pantomimes, and appeared in a revival of *Me and My Girl*, 1941. His speciality was trap-door acrobatics. Ida (born Jan. 1, 1916), daughter of Stanley, studied at the R.A.D.A. and first appeared on the screen in *The Love Race*. Joining the Paramount company in Hollywood, 1933, she built up a reputation as a serious actress in such films as *Peter Ibbetson*; *The Light that Failed*; *The Hard Way*; *Devotion*, 1946. She became an American citizen in 1947.

Lupino Lane (Henry George Lupino, b. June 16, 1892), cousin of Stanley and Barry, played in pantomime, music halls, musical comedy, revue, and films, beginning at the age of 11 as Master Nipper Lupino Lane. In 1937 he produced, presented, and acted in *Me and My Girl* at the Victoria Palace, giving 1,550 performances. In this piece he created the Lambeth Walk (*q.v.*). Another of his shows was *Meet Me, Victoria*, 1944. His brother, Wallace Lupino (b. Jan. 23, 1897), was also a dancer and actor.

Lupus. One of the ancient constellations. In the S. hemisphere, between the Centaur and the Altar, it contains several double stars.

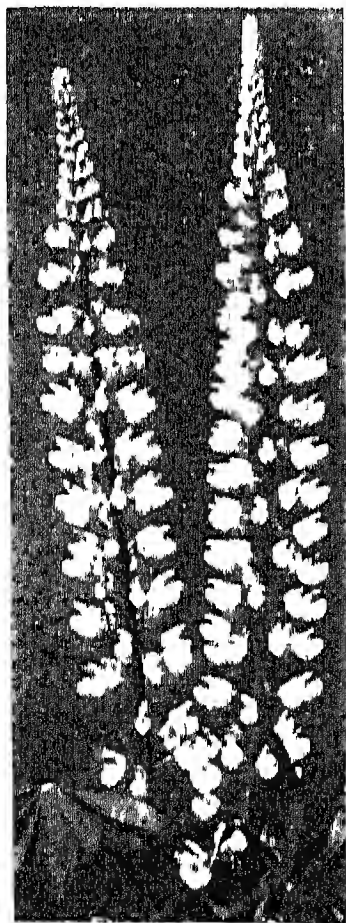
Lupus (Lat., wolf). Term applied to several distinct forms of disease of the skin. *Lupus vulgaris*, generally spoken of simply

as lupus, is due to infection with the bacillus of tuberculosis. The disease usually begins before the 10th year, and only exceptionally as late as the 20th. It is much commoner in females than in males. Unhealthy influences, such as bad housing and insufficient diet, increase the liability to the disease, as in all cases of tubercle.

Lupus may attack any part of the skin, but usually the nose, cheek, and ears. It begins with the formation of a little yellow or yellowish-red nodule or spot, which slowly spreads over the surrounding area; sometimes the centre of the patch heals with the formation of scar tissue, producing irregular lesions. Ulceration of the tissues may occur, leading to the destruction of parts of the nose, lips, or ears. The disease may last 20 or 30 years. General treatment consists in building up the constitution with good feeding and healthy living. Local treatment is to remove the affected tissue by caustics, canterisation, scraping the affected area, or in some cases excision. Treatment by the Kinsen light process, by light from a powerful electric lamp, the rays of which are passed through a column of distilled water, has been effective. Large doses of Vitamins A and D give good results.

Lupus erythematosus is an inflammatory disease of the skin, the exact cause of which is unknown. Much more frequent in females than in males, it usually begins with the appearance on the skin of flat red spots, which may have a smooth and dry or a scaly surface. The patch slowly spreads and often heals in the centre, producing irregular distribution. The bridge of the nose and the cheeks are the areas most often affected, and the shape of the patches in this region has led to the term butterfly lupus. The condition tends to last for a period of many years. Quinine, salacin, and arsenic are useful. The affected parts should be treated with protective lotions. Hot or cold air playing on the skin surface must be avoided, and a simple diet which does not cause flushing of the skin is indicated. As nearly all cases prove to be rooted in infected conditions of the teeth or sinuses, the clearing of this septic field is the first step in treatment.

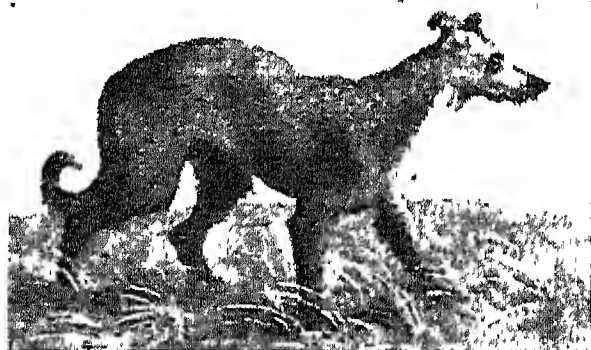
Luray. Village of Virginia, U.S.A., in Page co., 96 m. N.N.W. of Richmond, and on a rly. It has tanning, flour, and other industries, and in the locality are mineral springs. Luray is chiefly notable



Lupin. Flower-spikes of *Lupinus roseus*

for a magnificent stalactite cavern, discovered in 1878, having a depth of 260 ft.

Lurcher (from lurch, variant form of lurk). Cross between a greyhound and a sheepdog. This breed possesses wonderfully keen sight and scent, moves about in absolute silence, and is quick to perceive and obey the slightest sign from its master. It is a born poacher and takes to the business with hardly any training. The



Lurcher. Dog which is a cross between greyhound and sheepdog

lurcher is usually faithful to its master, but a dangerous foe.

Lurgan. Urban dist. of co. Armagh, N. Ireland. It is 20 m. by rly. S.W. of Belfast. The chief industry is the manufacture of linen; another is that of tobacco. The poet A. E. (G. W. Russell) was born here. Near the town is Lough Neagh. Lurgan was founded by settlers from England early in the 17th century, William Brownlow being mainly responsible. The barony of Lurgan, dating from 1839, is held by the Brownlows; Lurgan Castle is Lord Lurgan's seat. Pop. (1951) 16,181.

Luria, ISAAC (1534-72). Jewish mystic. Born in Jerusalem, he settled in Cairo, and became a merchant there. When about 30 he decided to give his life to study and meditation, and began to live in a hut near the Nile. From 1566 to 1572 he was at Sefid, where was a circle of Jews who held similar ideas, and among them he lived, an influential figure, until his death. Many stories are told of Luria's intense piety and asceticism, and of the curious forms it took. Disciples gathered around him, and he is said to have worked miracles. His teaching laid special stress on the sanctity of the Sabbath. See Jews; Mysticism.

Luristan. Mountainous region of W. Persia. It is bounded N. by Kermanshah, W. by Iraq, S. by Khuzistan, and E. by Hamadan. Anciently it was part of Elam, or Susiana. Khurramabad is the capital. The people are mainly semi-nomadic Lurs, allied to the Bakhtiaris. Area, 15,000 sq. m. This prov. is not to be confounded with Laristan, the district S. of

Farsistan, on the S.E. side of the Persian Gulf.

Lusaka. Capital of Northern Rhodesia. Situated on the main Cape-Congo rly., 80 m. S. of Broken Hill, the town is a prosperous farming centre in a rich mineral district. Its aerodrome is a port of call for Central African Airways. The foundation stone of the central govt. offices was laid by the duke of Kent in 1934 and the town became the capital in 1935. Old Lusaka and the new administrative centre were united next year. Pop. 2,700.

Lusatia (Ger. *Lausitz*). Dist. of Germany, which came to form parts of Prussia and Saxony. Upper Lusatia lies between Dresden and Breslau, just N. of Bohemia, and Lower Lusatia between Dresden and Berlin. The name comes from the Slavonic tribe, the Lusitzi. The boundaries of the district varied both before and after it became German about 900. It was a border region, and a margrave of Lusatia is occasionally mentioned, but it never became a separate state. Both parts passed to the king of Bohemia; Upper, then called Baudissin, the old name of its capital Bautzen, in 1160, and Lower, two centuries later. Both were afterwards for some years part of Hungary. In 1620, during the 'Thirty Years' War, Lusatia was taken by the elector of Saxony, who retained it by the treaty of 1635. By then the majority of the people had become Protestants. In 1815 Prussia secured much of Lusatia, Saxony retaining only Bautzen and about 900 sq. m. of Upper Lusatia. The upper course of the Spree flows through the district. The chief towns in Lower Lusatia are Guben and Kottbus; in Upper, Bautzen and Görlitz.

Lushai Hills. Older name of Mizo dist., Assam, India, a wild and comparatively unknown area between the Manipur and Chittagong Hill tracts, bounded on the E. by the Chin Hills, Burma. Most of it drains N. to the Surma river. The Blue Mt. (7,100 ft.), in the S., lies within the great hairpin bend of the Kaladan river. The h.q. is Aijal. Perhaps 70 p.c. of the area is cultivable, but only 2 p.c. is tilled, almost entirely for rice. Area, 8,142 sq. m. Pop. (1951) 196,202, of whom 90 p.c. were primitive animists. The Lushais having repeatedly raided what was then British territory, expeditions were undertaken against them in 1871-72 and 1889-90, and their country was annexed.

Lushington, STEPHEN (1782-1873). British judge and reformer. Born Jan. 14, 1782, second son of



Stephen Lushington.
British judge

Sir Stephen Lushington, chairman of the East India Co., he was educated at Eton and Christ Church, Oxford, and was called to the bar at the Inner Temple in 1806. An M.P. for Great Yarmouth, 1806-08, and Hechester, Tregony, and the Tower Hamlets, 1820-41, he was a prominent Whig, and ardently supported the abolition of the slave trade, R.C. emancipation, and parliamentary reform. In 1820 he was one of the counsel for Queen Caroline (*q.v.*). He was judge of the consistory court of London, 1828-38, and dean of arches during 1858-67. His decisions as admiralty judge, 1838-67, are still cited. He died Jan. 19, 1873.

Lushun. English form of the Japanese name for Port Arthur (*q.v.*), sometimes used during Japanese control of Manchuria.

Lusiads, THE. English title of the chief work of the Portuguese poet Camoens (*q.v.*). The original title is *Os Lusíadas* (The Lusitanians), and the poem is an epic in *ottava rima* telling the story of Portugal and its navigators. There are English translations by W. J. Mickle, 1775; J. J. Aubertin, 1878; Sir Richard Burton, 1880; W. C. Atkinson, 1952.

Lusignan. Town of France, in the dept. of Vienne. It lies on the right bank of the Vienne, 16 m. by rly. S.W. of Poitiers. There is local agricultural trade and brush making is carried on. The church was originally the chapel of a priory founded in 1025, and there are remains of the cloister of the Lusignan family.

Lusignan is famous as the seat of a noble family whose origins are traced to Hugh I, who lived in the time of Louis IV (936-954). One branch of the house remained in France and several of the most distinguished French families claim relationship with this. Another was that which founded the line of kings of Cyprus and Jerusalem. Amalric became constable of Jerusalem, c. 1180, and succeeded his brother Guy (*q.v.*) as king of Cyprus, 1195, and became king of Jerusalem, 1197. The Lusignan dynasty ruled in Cyprus until 1475. To Hugh IV Boccaccio dedi-

cated a work. Peter I (d. 1369), a lifelong foe of the Saracens, was the last typical representative of the Crusaders. Under James II (1440-73) the line became virtually vassals of Venice, and the last king was his posthumous son, James III. From 1342 to 1375 members of the family reigned in Armenia. *See* Cyprus; Jerusalem; Melusina.

Lusitania. A part of ancient Spain. Originally the territory of the Lusitani, an Iberian tribe, between the rivers Tagus and Douro, it became a Roman prov. of Hispania in 27 B.C. Corresponding roughly with the present Portugal, it embraced also Spanish Estremadura and part of Leon, reaching almost to the city of Toledo. Mérida (Augusta Emerita) was the capital. Patriotic writers of the 15th cent. applied the name to Portugal. *See* Spain.

Lusitania. Cunard liner, torpedoed and sunk in the First Great War by a German submarine off the Old Head of Kinsale, Cork, May 7, 1915. She was one of the world's largest liners, her tonnage being 31,500 gross. After a warning by the German commander, two torpedoes were fired at the ship, which sank within 20 mins. of being first struck. She was on her way from the U.S.A., and had on board 1,255 passengers and 651 crew. Of these 1,198, including 124 Americans, were either drowned or killed. This incident, which caused serious anti-German rioting in the E. end of London, horrified the world, in particular the still neutral U.S.A. In Germany a medal was struck in commemoration. *Consult* The Last Voyage of the Lusitania, A. A. and M. Hochling, 1957.

Lussin OR LUSSINO (Yug. Losinj). Island of the Adriatic off

the E. of Istria. The pop. exceeds 8,000, although the island covers only 28 sq. m. There is a good harbour, Lussin Piccolo. Lussin was ceded to Italy by Austria after the First Great War. On the surrender of Italy to the Allies in 1943, it was occupied by German troops, but Yugoslav patriots landed on Oct. 3 and overcame the garrison. After the war Lussin was handed over by Italy to Yugoslavia, although the people are predominantly Italian.

Lustre. In optics, a characteristic appearance, or sheen, of certain objects which reflect light. According to the nature of the surface from which the light is reflected, lustre is described as metallic, vitreous, pearly, silky, resinous, or adamantine. The intensity of lustre is splendid, shining, glistening, or glimmering. Its cause is probably related to absorption and reflection of the rays of light below the surface layer of the substance. *See* Iridescence.

Lustre. Term applied to pottery covered with an iridescent metallic film or glaze. The earliest kind was silver; then golden copper iridescent glazes were introduced. *See* Belleek Ware.

Lustrum. Religious ceremony for the purification of the people of ancient Rome, conducted by one of the censors just before the expiration of his term of office. This term became fixed at five

years, and by a natural transition the word *lustrum* came to be applied to that period of time.

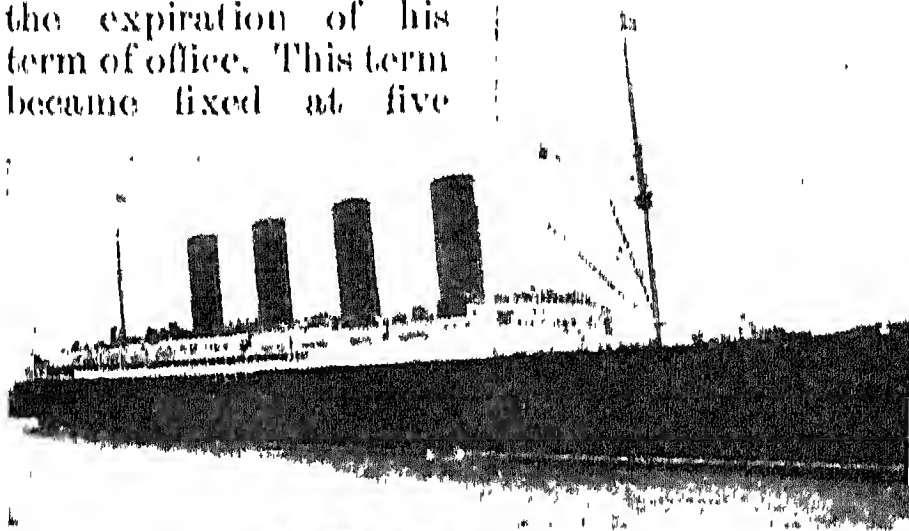
Lute (Lat. *lutum*, mud). A pasty mixture used to seal orifices and cracks. The term is used more specifically in connexion with chemical and metallurgical plant. Luting pastes are used e.g. for repairing cracks and sealing joints in chemical stoneware plants. Inert resistant materials, such as powdered asbestos, quartz, and barytes are sometimes added. When greater elasticity and plasticity is required, packings made of asbestos rope soaked in linseed oil or paraffin wax are often used. There is an increasing tendency to use special packings of impregnated sheets and rings cut to standard size and shape. Such materials often consist of asbestos cloth or board impregnated with suitable oils or with rubber; sometimes unvulcanised rubber is used and sulphur incorporated so that vulcanisation occurs *in situ*.

Sodium silicate (water glass) cements are widely used in chemical plant where resistance to acids is of first importance and the joint is not subject to mechanical strain. Quartz, asbestos, barytes, and similar powdered materials form the solid ingredient. Under the action of acid, silica is formed, and the joint becomes hard though

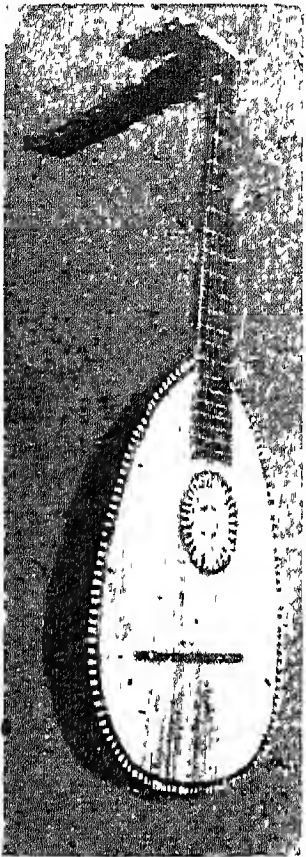
somewhat brittle. Such cements resist strong acid but not water or alkali. Where heat resistance and mechanical strength are not important, sulphur and sand make a satisfactory and resistant joint. Sometimes about 2 p.c. carbon

black is added to improve flowing quality. The luting is applied hot and sets on cooling. For glass joints pure glycerine and pink or yellow litharge in the proportions of one to five are much used.

Lute (Fr. *luth* from Arab. *al ud* the wood). Stringed instrument in great vogue from the earliest ages to the 18th century. It is of Eastern origin, and is said to have come westward with the returning Crusaders. The body is usually pear-shaped, built up with staves of wood like a cask, and often highly decorated. It has a long neck and finger-board with frets (q.v.). Many varieties existed,



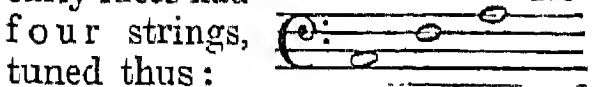
Lusitania. Top, the Cunard liner at anchor. Below, medal struck by German government to commemorate its sinking. On reverse, left, Death issuing tickets at the Cunard office, above which are the words Business above everything. On the obverse, right, above the sinking vessel are the words No Contraband; below The Lusitania sunk by a German submarine, 7 May, 1915



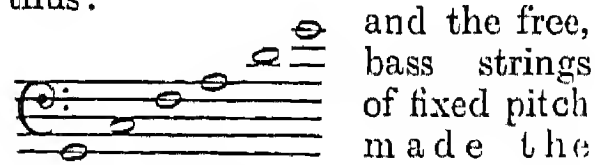
Lute, inlaid with ebony and ivory, French, 17th cent. Victoria and Albert Museum

and still exist, in the East, and many sizes were in use in Europe also during the 16th and 17th centuries—*e.g.* treble, small mean, great mean, counter tenor, tenor, and bass. A larger type of lute, known as the theorbo or arch-lute, had some extra, deep strings, tuned to some of the principal scale notes. The tuning of these bass strings had to be altered

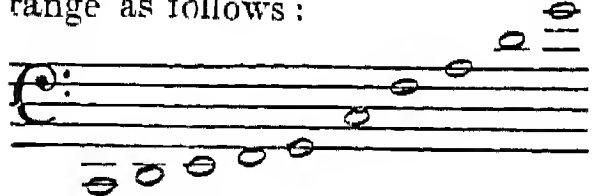
when the music changed its key, and the lute family thus had an important influence on musical form (*q.v.*), it being the custom, for the sake of convenience, to write all the movements of a suite (*q.v.*) in the same key. According to old authorities, the early lutes had four strings, tuned thus:



Later two extra strings appeared, thus:



range as follows:



Other kinds of tuning were employed. The tone of the larger lutes was an adequate support for a solo voice, and the bass strings were effective in the primitive orchestras of the 17th century.

Lutecium. A chemical rare-earth element. It was discovered in 1908 by the French chemist G. Urbain, being isolated from an ore of ytterbium, with which it is usually associated. It has atomic number 71, atomic weight 174.99, and its chemical symbol is Lu. It is called after Lutetia (*v.i.*).

Lutetia OR LUTETIA PARISI-ORUM. Chief town of the Parisii, a Gallic tribe. Mentioned by Caesar, it was on an island (the present Île de la Cité) in the Sequana (Seine). The Romans built a town on the left bank of the river; it was destroyed in the 3rd cent., and a new one was built on the island.

This, in the 4th cent., came to be called Parisii, whence the name Paris.

Luther, HANS (b. 1879). A German statesman. Born in Berlin, March 10, 1879, he was lord mayor of Essen from 1918. Popular for his resistance to French military occupation of the Ruhr in 1923, and having consequently lost his position, he joined Cuno's cabinet as minister of food, where he proved an impartial administrator. He soon became minister of finance under Stresemann and shared the credit for the stabilisation of the German currency. Luther took part in the London negotiations on the Dawes plan, and himself became chancellor, 1925-26. In 1930 he succeeded H. Schacht as governor of the Reichsbank, but was ousted by the latter after Hitler assumed power. Ambassador to Washington, 1933-37, but never a party man, he was imprisoned as a suspect in connexion with the July plot, 1944. When released in 1945 he retired from politics.

Luther, MARTIN (1483-1546). German reformer. He was born at Eisleben, Nov. 10, 1483. The family life was often one of struggle against want, but the boy had a good education at Magdeburg and Eisenach, and was sent to the university of Erfurt, where he took his master's degree in 1505. Then suddenly he entered a monastery at Erfurt, because, as he put it, he doubted of himself—*i.e.* of his salvation in the world. He was the most rigorous of monks, but his convent life became a prolonged agony of soul, which was not ended till, chiefly from reading the Pauline epistles, he became assured that salvation consisted not in his presenting to God a credit balance in his moral life, but was a free gift in Christ, in Whom God, here and now, was ready to forgive and be friends with any man who turned to Him with repentance and faith.

This evangelical liberation made a new man of Luther, but it did not make him any less a Catholic monk, and he had no idea of leaving the convent or the Church. His career followed a normal course, and in 1508 he was transferred to the university of Wittenberg, where he taught and preached with great power. The ecclesiastical crisis of his life was precipitated by the appearance in Wittenberg of a friar, John Tetzel, selling indulgences under the papal authority. Not only had the traffic many elements of scandal, but it raised for Luther the whole

doctrine of the forgiveness of sins. He intimated that he proposed to discuss this publicly, and, according to the usual academic form, posted up certain theses for discussion. But Luther's 95 theses were thunderbolts, and their appearance in 1517 is rightly reckoned as marking the actual beginning of the Reformation.

Luther was summoned to Rome, but this first order was withdrawn, and conferences were held between him and the Church authorities, the most notable being at Leipzig in 1519, where he was accompanied by Melancthon. These conferences did not convert Luther but rather made him a popular hero, as a German asserting truth and freedom against papal corruption and tyranny. He had now a great audience, to which he further appealed in his three treatises on Christian Liberty, The Reformation of the Christian Estate, and The Babylonish Captivity of the Church. A breach with Rome rapidly became inevitable. When, in 1520, a papal bull condemned his views, he publicly burned it in Wittenberg. The daring of the deed made an immense impression.

Luther's heresy was now a matter of national concern, and he was summoned to the diet at Worms in 1521. His journey there was like a royal progress. Faced by both imperial and papal power, he would retract nothing. The authenticity of his famous saying "Here I stand, I can do no other" is disputed, but there is good authority for believing it. He left Worms in 1522 under warning of outlawry. Seized by friendly violence, he was carried off secretly to the castle of the Wartburg in the Thuringian Forest, where he remained in safety for a year, and wrote his great German translation of the Bible and many famous hymns.

Luther then returned to the battle of the Reformation and the task of organizing the German Protestant Church. For a time he clung to the idea that he might reform the existing Catholic church in Germany, but this hope failed. His work was disastrously complicated by the outbreak of the Peasants' War, 1522, with its class bitterness and savagery. Luther, never really a democrat, urged the princes to put down the rising with relentless severity, and thus lost popular sympathy for the Protestant cause, besides making the German Protestant Church crass and oligarchic. Luther's later



Martin Luther, from the bronze statue by Siemering, unveiled at Eisleben in 1883

life was engrossed with ecclesiastical and theological discussion. In 1525 he had married Catherine von Bora, who had been a nun; and, while the marriage of two persons who had taken the vow of chastity caused scandal, his home life is the sweetest side of his tumultuous career. He died Feb. 18, 1546, at Eisleben, and is buried at Wittenberg.

Whatever differences of opinion there may be about Luther's Protestantism, there can be no question of the extraordinary greatness of the man. Both the good and the bad in him were on the grand scale. He was also a personality full of great contradictions. His extreme violence is matched by his beautiful tenderness; his frequent coarseness—which it is unjust to represent as anything in the nature of vice—by an often surprising delicacy; his masterfulness and impatience were complemented by tact and prudence. No man of his time more powerfully broke through to reality, yet his mind never lost a strain of superstition. Finally, the amazing self-confident egotism of his assertions before men is matched only by his utterly humble reliance upon God in his prayers. It is not possible to characterize such a man from one point of view. His faults, limitations, and errors are better known today than ever; but even these little alter the impression of a personality which can hardly be described as less than immense and a power which was truly elemental.

P. Carnegie Simpson

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moirs, J. Michelet, Eng. trans. W. Hazlitt, 1846; Lives, J. Kostlin, Eng. trans. 1877; T. M. Lindsay, 1900; A. C. McGiffert, 1911; H. Grisar, Eng. trans. 1913; J. MacKinnon, 1930; F. F. Brentano, 1936.

Lutheranism. Form of religious faith, based on the teaching of Martin Luther. The Lutheran Church—the first and still the largest of the ecclesiastical organizations resulting from the Reformation—was named after the great German reformer against his own desire, and its truer name is the "Evangelical" as distinguished from the "Reformed" Church, the latter being the title appropriated to the Calvinistic communions. The whole idea of a formation of a new church, or separation from the "Catholic" Church, was



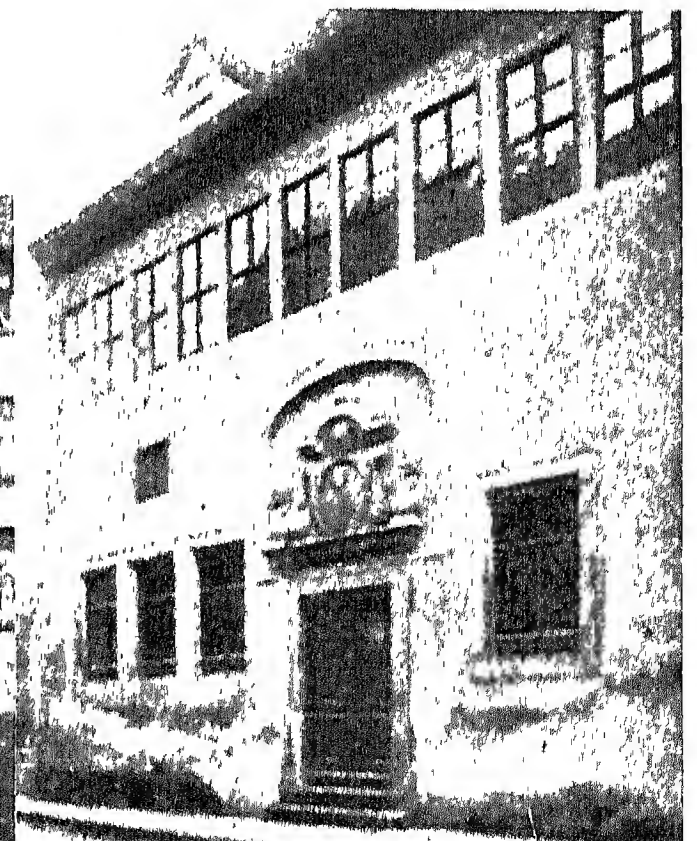
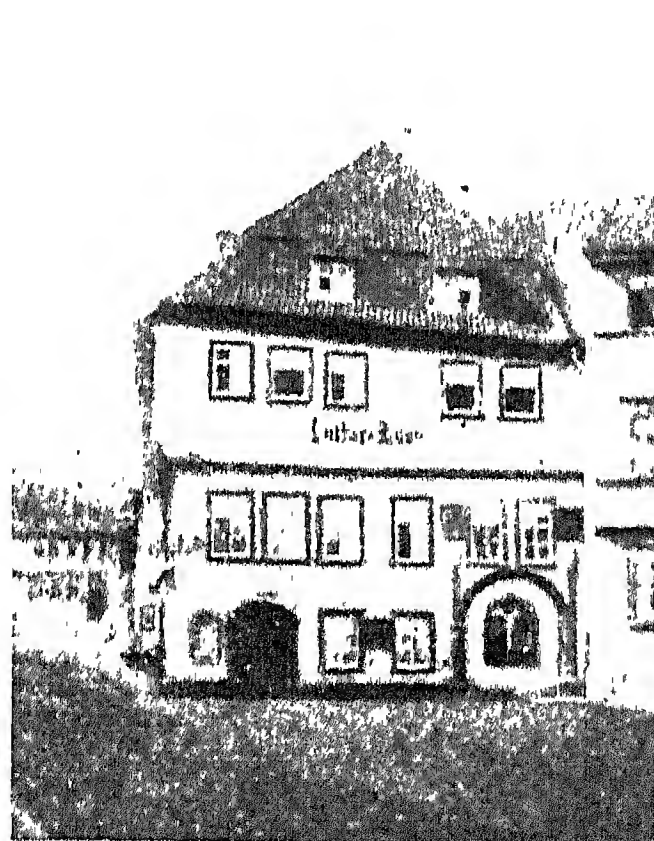
Martin Luther

From the portrait by Holbein, Windsor Castle
no part of Luther's earlier aim. He hoped to see the Catholic Church in Germany, at least, purified by the preaching of the true gospel aided by the civil authority; and

with this he would have kept the bishops and even recognized the pope as *summus episcopus*. Hence, the earliest arrangements in the congregations which accepted the reformed teaching in Germany, were of a makeshift character. But gradually it became clear that the reforming party could not live and work within the Roman Church. The pope excommunicated Luther, and Luther's attitude to the pope hardened into defiance and even detestation. An evangelical Church was imperative, if the evangel as the reformers conceived it was to survive in Germany.

Luther set about this, in the first instance, by arranging, in 1525-27, for a visitation of various districts, and this visitation revealed a state of great confusion in the reformed areas. In particular many of the priests who accepted the evangel as Luther taught it, were ignorant and quite incapable of organizing and governing a Church. To meet the situation, superintendents were appointed who acted in co-operation with the secular authorities. The government of the new Church—as also the control of schools and the care of the poor—came under consistories which were constituted by the territorial prince. It was not democratic, and Lutheranism never was self-governing, as from the first the Calvinistic Churches were.

This was due partly, no doubt, to the exigencies of the time; but also to the fact that Luther never was a democrat and after the Peasants' War was less than ever inclined to be one—and also because he found the legatee of the old *ius episcopale* in the princes rather than in the people. Thus the organization of the German Protestant Church had grave defects. It was makeshift, oligarchic, and



Martin Luther. Left, the Cotta house at Eisenach, where the reformer spent part of his youth; right, the house at Eisleben where he was born

erastian. Luther—a man of genius in root principles of evangelical religion—had really no principles here, and simply took what the situation seemed able to afford. The Calvinistic Reformed Church was organized very differently.

In worship, as distinguished from government, the Lutheran Church was more free to follow its religious ideals. In some things—such as altars, candles, liturgy, clerical dress—Luther was conservative. Also the great Church festivals were retained. But the two characteristic features of Lutheran church worship were the place given to the preaching of the word and the congregational singing of hymns. The former is notable all through the Reformation beyond Germany as well as in it; but congregational singing was pre-eminently characteristic of Lutheranism. The medieval Roman Church had magnificent hymns, but these were sung by the choir. Lutheran hymns—Luther wrote about 40—gave the people a new voice, and were a notable feature in the reformed cultus. Luther's most famous hymn—*Ein' feste Burg*—spread all over Germany and became a national chorale.

Basis and History

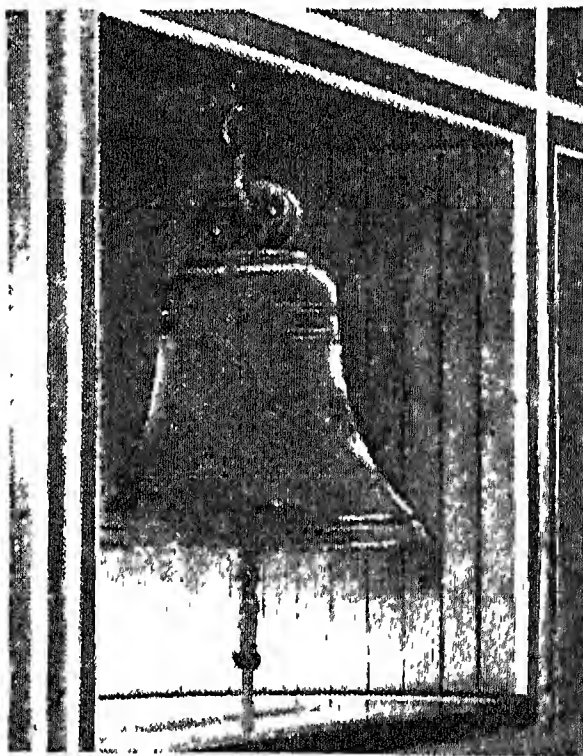
Theologically, the fundamental standard of the Lutheran Church is the Confession of Augsburg of 1530. Its doctrinal matter is mainly Luther's, but its style and tone breathe the more conciliatory spirit of Melancthon. The Lutheran Church still bears the title of "the Church of the Augsburg Confession."

The history of the Lutheran Church is complicated, but its main phases may be mentioned. After its formative period, Lutheranism suffered from a period of theological strife and then sank into a moribund orthodoxy. The movement known as pietism, beginning in the latter part of the 17th and continuing up to the middle of the 18th century, served to deliver it from this. The father of German pietism was Spener (d. 1705), and under him it was both a revival of evangelical and practical religion, and an effort to make church organization less dependent on the secular authority and more the responsible work of the Christian people. But the royal supremacy continued to assert itself, sometimes in a tolerant and even indifferent spirit, as when Frederick the Great declared that all religions are equally good, and sometimes with a narrow goal, as when Frederick

William II tried to penalise Socinianism and deism.

Under Frederick William III, efforts were made to reorganize the Church with a view to a union between the Lutheran and the Calvinistic Confessions, both of which had their adherents in Germany. The king's appeal for this in his proclamation of 1817—about the time of the tercentenary of the Reformation—evoked widespread response, and various unions were realized in the smaller German states. In Prussia more difficulties were encountered, which were only partially solved when, in 1817, a union was accomplished under the name of the Evangelical United Church.

In the German empire created by Bismarck in 1871, the Lutheran Church was a state-established, state-controlled body; but it exhibited a vigorous life, both intellectually and religiously, and had within its borders both a



Lutine Bell. Bell salvaged from the wreck of the frigate *Lutine* and now in the underwriters' room at Lloyd's. The bell is tolled on the receipt of important news

liberalism which extended to rationalism, and an evangelicalism which included pietism. On the fall of the Imperial regime in the First Great War, a change came over the relations of Church and state under the Weimar republican constitution; but this government was short-lived, and National Socialism arose under Hitler. In the early days of the Nazi movement, Christianity was recognized as the 24th article of the party programme; but as Hitlerism developed its anti-Christian character was unmistakable, and the Nazi state more and more sought to use the Church for its political ends. This led to much division within the ranks of the Church, whose religious work was carried

on under great difficulty. But resolute resistance was offered by many pastors and congregations; and this saved the soul of the Church for the day of liberation which came with the collapse of Nazism in 1945. See Calvinism; Reformation.

P. Carnegie Simpson

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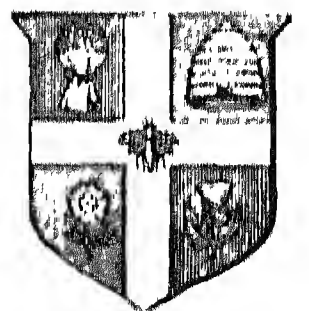
Lutine, *LA*. A French frigate captured by the British. Renamed H.M.S. *Lutine*, she sailed in 1799 for Texel, off the Netherlands coast, carrying nearly £1,000,000 in specie. The ship was wrecked, there being only one survivor. Dutch fishermen obtained thousands of pounds' worth of gold from the wreck, and between 1857 and 1861 about £40,000 was recovered. In 1911 an attempt was made to bring up the bulk of the treasure, but after moving a million tons of sand only 5 grains of gold were recovered.

Lutine Bell. Bell of the old frigate *Lutine* (v.s.). During the attempts to recover the treasure lost when the vessel was wrecked, the ship's bell was salvaged and afterwards suspended in the rostrum of the room at Lloyd's, London, where the main business of insurance is transacted. The receipt of important news, such as a wreck or the arrival of an overdue vessel, is announced by tolling the bell.

Luting. For the details of this mixture, used for filling orifices and cracks, see *Lute*.

Luton. Borough and industrial town in Beds, England. It stands near the source of the Lea, 30 m. N.W. of London.

The chief building is the parish church of S. Mary, a large cruciform building, partly Early English, with a unique hexagonal baptistery. A new town hall in classic design, opened in 1936, replaced one burned down during the peace celebrations of July, 1919. Luton was once the centre of the strawplait industry, and the manufacture of ladies' hats is still a staple trade, though straw is not now a major material. Other important products include motor cars and lorries, aeroplanes, ball bearings, scientific instruments, and



Luton arms



Luton, Bedfordshire. The Town Hall, opened 1936. It was built to replace a former hall, destroyed by fire in July, 1919

chemicals. Luton, exclusive of Leagrave and Limbury wards, forms a bor. constituency. There are grammar schools for girls and boys. Luton Hoo mansion, built by Robert Adam for the 3rd earl of Bute, 1762, with an art gallery and collection of tapestries, furniture, jewelry, etc., was opened to the public by Sir Harold Wernher in 1950. Pop. (1951) 110,381.

Lutsk (Polish Luck). Town of Ukraine S.S.R., in the region of Volhynia, formerly a Polish co. It is 40 m. E. of Vladimir, on the Styr and the rly. from Kazatin to Brest-Litovsk. There are cloth factories, tanneries, and paper mills. In the 11th century Lutsk was the capital of an independent principality; after passing into the hands of the Lithuanians and Poles, it was annexed to Russia in 1791.

The battles of Lutsk in the First Great War took place in 1915 and 1916. Following up strongly from the capture of Kovel and Vladimir Volynsk, an Austro-German force took Lutsk, Aug. 31, 1915. On the night of Sept. 7-8 the Russians launched a counter-offensive; on Sept. 23 they captured vital positions N. of Lutsk, and the town again fell into their hands. They had outrun their lines of communication, however, and were forced to retire on Sept. 28. On June

4, 1916, Russians in the Volhynia area attacked N.W. towards Lutsk and S.W. towards Brody and Lemberg (now Lwow). Lutsk fell to them within two days, a gain of 20 m.; pushing on, they penetrated to within 20 m. of Kovel and the same distance of Vladimir Volynsk.

After the partition of Poland by Germany and Russia in Sept. 1939, Lutsk was included in the Russian zone. The Germans captured it at the end of 1941 and held it until Feb. 5, 1944, when their garrison was driven out by units of the 1st Ukrainian army. It went, with the rest of Volhynia, to Russia by the Russo-Polish treaty signed in Aug., 1945.

Lutterworth. Market town of Leicestershire, England. It stands on the Swift, 7 m. N.E. of Rugby and 90 m. by rly. from London. It is chiefly famous for its associations with John Wycliffe, rector here 1374-84. S. Mary's church, a fine old building, contains the pulpit and other relics of the reformer. There is an obelisk to his memory in the town. Market day, Thursday. Pop. (1951) parish, 3,197.

Luttrell Psalter. English illuminated manuscript of the 14th century. Executed about 1342 for Sir Geoffrey Luttrell, it

is one of the most interesting illuminated manuscripts and is preserved in the British Museum. It is illustrated with a lovely series of miniatures, in glowing colours, depicting sports, pastimes, customs, business methods, and every aspect of country life.

Lutyens, Sir Edwin Landseer (1869-1944). A British architect. Born March 29, 1869, he studied at the R.C.A. and began his career in 1888. During the 1890s he designed country houses and, in collaboration with Gertrude Jekyll, gardens notable for fine sense of detail. His chief works in London included Hampstead Garden



Lutterworth, Leicestershire. Parish church of S. Mary, restored and enlarged since the time of Wycliffe
Valentine

Suburb, S. John's Institute, Tufton St.; houses in Little College St. and Smith Sq., Westminster; Britannic House, Finsbury Sq.; Midland Bank, Piccadilly; elevation of Midland Bank, Poultry; and fountains in Trafalgar Sq.

In 1912, when a member of the advisory committee to the government of India, Lutyens, with Sir Herbert Baker, designed the site and architectural scheme of New Delhi. This grandiose conception, like the R.C. cathedral at Liverpool, ranks among his most ambitious achievements, though in the U.K. he is associated chiefly with domestic architecture, and has been described as the innovator of the modern country house. As an architect, he was said to have evolved from the picturesque to the monumental.



Luttrell Psalter. Illumination from the Psalter, showing Sir Geoffrey Luttrell going out to uphold the family honour in a tournament. He is equipped by his wife, who hands him helmet and pennon, while another lady carries the Luttrell shield

The Cenotaph in Whitehall (reputed to have been worked out on a scribbling block during luncheon)



Sir Edwin Lutyens,
British architect

expresses his sense of a national monument. Other war memorials included those at Villers-Bretonneux and Manchester. He designed Hampton Court bridge; the tomb of George V at Windsor (with Reid Dick as sculptor); an open-air memorial to George V, Windsor; the Queen's doll's house; Benson Court, Magdalene College, Cambridge, etc. Lutyens was elected A.R.A. in 1913, R.A. in 1920, president of the Royal Academy in 1938. Knighted 1918, he received the O.M. 1942. He died Jan. 1, 1944. *Consult* Lives, R. Lutyens, 1942; A. S. G. Butler and C. Hussey, 1951; Candles in the Sun, Lady Emily Lutyens, 1957.

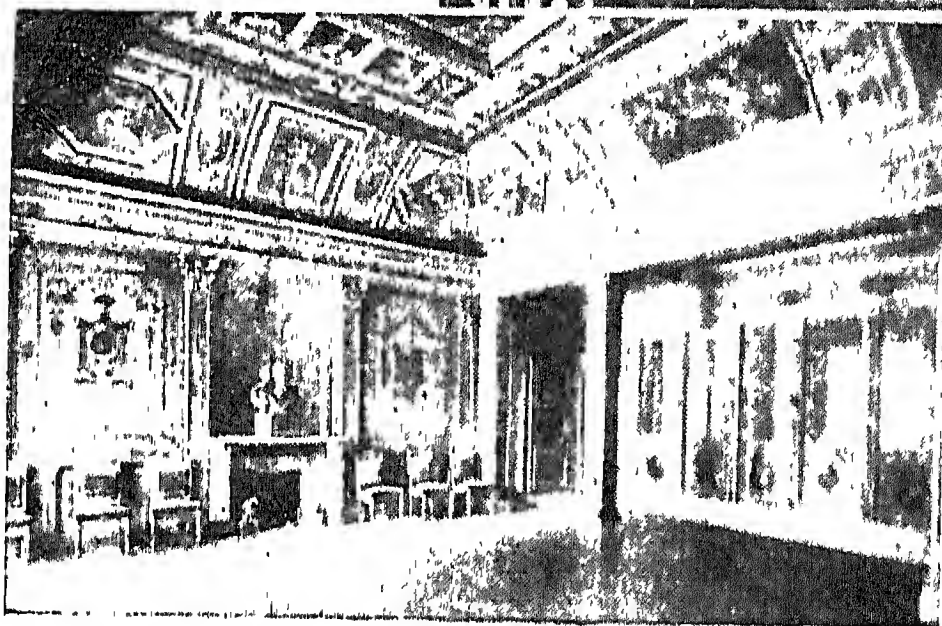
His third daughter (Agnes) Elisabeth (b. 1906) achieved distinction as a composer of chamber music and music for films.

Lützen. Town of E. Germany, 12 m. S.W. of Leipzig, famous as the scene of two great battles. On Nov. 16 (N.S.), 1632, Gustavus Adolphus, king of Sweden, died in defeating the Imperialists under Wallenstein. On May 2, 1813, Napoleon defeated the Prussians and Russians.

In 1632 Gustavus was campaigning in Germany. With 20,000 men he marched from Naumburg to pick up a contingent of Germans, for Wallenstein was near Lützen, and a battle was soon almost inevitable. On Nov. 15 news that Wallenstein had sent off a considerable force on a plundering expedition caused Gustavus to change his plans. He turned towards Lützen to find and to fight a weakened enemy.

The enemy was ready. On Nov. 16 Wallenstein's army, also about 20,000 strong, was drawn up near Lützen. The infantry were in masses in the centre; the cavalry were on the wings; the artillery were in the front. The Swedish army had its trained infantry in smaller groups, but it, too, had cavalry on the wings and artillery in front. After some artillery exchanges, the battle was joined. The Swedish horse dashed against their foes and put them to flight, but the infantry, who had also taken the initiative, were not able to equal that performance. A

stout fight was waged at close quarters, and while this was proceeding Gustavus, leading his men to a threatened part of the line, was killed. Wallenstein's men then met with a temporary success until Bernhard of Saxe-Weimar, having taken over the command, succeeded in rallying the Swedes, and the lost guns and the ground were recaptured. The last stages of the battle began with the charge of Wallenstein's cavalry, just returned from their foray. They met with some success, but their leader, Pappenheim, was killed. The Swedish reserves then advanced,



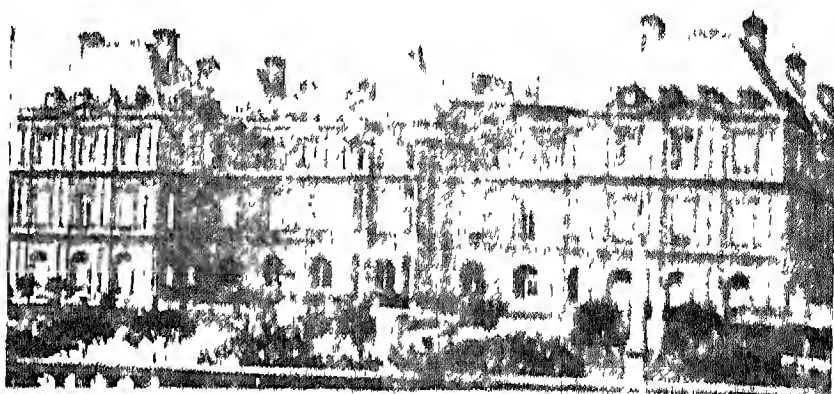
Luxembourg, Paris. Salle du livre d'or, gallery in the palace, where the golden book of records of the reigning family was formerly kept. Walls and ceiling were decorated by pupils of Rubens. Top, right, south front of the palace

and their charge decided the day, for the Imperialists fled. The site is marked by a chapel and other memorials. (See Gustavus Adolphus; Thirty Years' War.)

Before the second battle of Leipzig Napoleon's huge conscript army of combined nations had been reduced to a cipher by his Russian campaign, but he had, by the spring of 1813, 200,000 men moving towards the Elbe to meet the allied concentrations. He assumed command at Erfurt, April 25, and moved his advance guard on Lützen. The allied commander, Wittgenstein, designed to surprise him by an attack on the advance guard with a small force, while the remainder of his army was directed against Napoleon's right and rear. The combined Prussian and Russian attack began about 9 a.m. on July 2 just as the French main body was reaching Lützen. At 11 a.m. Napoleon heard Wittgenstein's guns opening the attack on his right rear, and, divining his plan, he galloped to the scene of action, and with his old promptness planned a counter-scheme. He organized a battle reserve, and disposed the remainder

to resist attack; waiting till both sides were exhausted, he then sent forward 100 guns to make a gap with ease shot in the enemy line; and, pushing forward his reserve, finished the battle.

Lützow, PRANCE, COUNT (d. 1916). Bohemian historian. He belonged to a noble family of that country, but on his mother's side



was of English descent. He was a member of the Austrian Reichsrath, 1885-89, and from 1881 to his death was chamberlain to the emperor of Austria. Much of his time was spent in England, and he held the Beloeil professorship in Slavonic language at Oxford. He

wrote on Bohemia in English and his works include *Bohemia: An Historical Sketch*, 1896; *History of Bohemian Literature*, 1899; *Life and Times of Master John Hus*, 1909; and *The Hussite Wars*, 1911. He died Jan. 13, 1916.

Lützow, LUTZOW, ADOLF WILHELM, BARON VON (1782-1834). German soldier. Born May 18, 1782, he entered the Prussian army in 1795 and served in it until 1808, having fought at Auerstedt and elsewhere against Napoleon. In 1811 he returned to the service and in the war of liberation raised a corps of irregulars, known as the black Jägers, which served against France until 1814. Lützow was with the cavalry of the regular army at Waterloo, and retired in 1830. He died Dec. 6, 1834. The German battle cruiser Lützow was sunk at Jutland, 1916. The "pocket" battleship Deutschland was renamed the Lützow in 1940.

Lux. Unit of illumination, the light produced by one candle power one metre away.

Luxembourg. Most southerly province of Belgium. It comprises the Belgian part of the Ardennes highlands, and is the

most scantily peopled portion of the country. Iron is mined, slate quarried, and cast-iron manufactured. It was severed from the grand duchy of Luxembourg in 1839. Area, 1,706 sq. m. Pop. 216,745.

Luxembourg. French palace, situated on the left bank of the Seine in Paris. It was designed in 1615 by Jacques de Brosse, for Marie de' Medici, and erected on the site of a mansion purchased in 1612 from the duc de Piney-Luxembourg. De Brosse was instructed to copy the Pitti Palace at Florence, but the design, with its two bold flanking pavilions, bears little resemblance to the latter. The queen adorned the palace in the costliest manner, but after her death it was neglected. In 1836 the palace was almost entirely remodelled by A. de Gisora, who extended the garden façade by more than one-third, and rearranged the interior. The Musée du Luxembourg, famous for its collection of modern works of art, is on the E. side of the building. The Luxembourg Gardens, originally laid out by J. de Brosse, are extensive and beautiful.

Luxembourg, FRANÇOIS HENRI DE MONTMORENCY - BOUTEVILLE, DUKE OF (1628-95). French soldier.

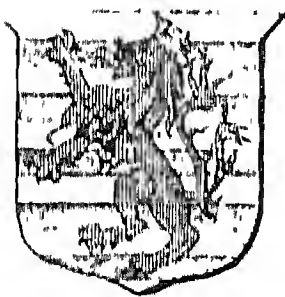


François Luxembourg.
French soldier

Born Jan. 8, 1628, in Paris, he was related to the Condé family, and was educated with his cousin, the great Condé (q.v.). To escape the consequence of their share in the Fronde, the two entered the Spanish service together. In 1659 François re-entered the French army and soon, having married an heiress, was made duke. In the war that began in 1672 he was in command of a force which defeated the Dutch under William of Orange, but his reputation was made by a retreat he conducted from Utrecht when followed by superior forces. He captured Valenciennes during the war that ended in 1678. On the renewal of war in 1689 Luxembourg, regarded as France's first soldier, was put in command in Flanders, where he beat his life-long adversary, William of Orange, at Steinkirk, Aug. 3, 1692, and Neerwinden, July 29, 1693. He died in Paris, Jan. 4, 1695.

Luxemburg. Country and a grand duchy of Europe. It comprises the S. portion of Ardennes

Highlands, draining to the Moselle, which forms its S.E. frontier. Belgium lies to the N. and W., France to the S., and Germany to the E. Its area is 999 sq. m.



Luxembourg arms

ette iron-field stretches into France. Up to 1914 Belgium imported quantities of iron ore from here, while a good deal more was turned into pig iron and exported to Germany. Three-fifths of the area is cultivated; oats and potatoes being the main crops, then wheat. The vine is grown in the Moselle valley; and horses and cattle are reared. The chief river is the Sure or Sauer. In addition to Luxembourg, the capital, the chief towns are Esch, Differdange, and Dudelange. Most of the people are R.C. The govt. is in the hands of a chamber of 52 deputies elected for five years and a cabinet. Pop. (1956) 311,633.

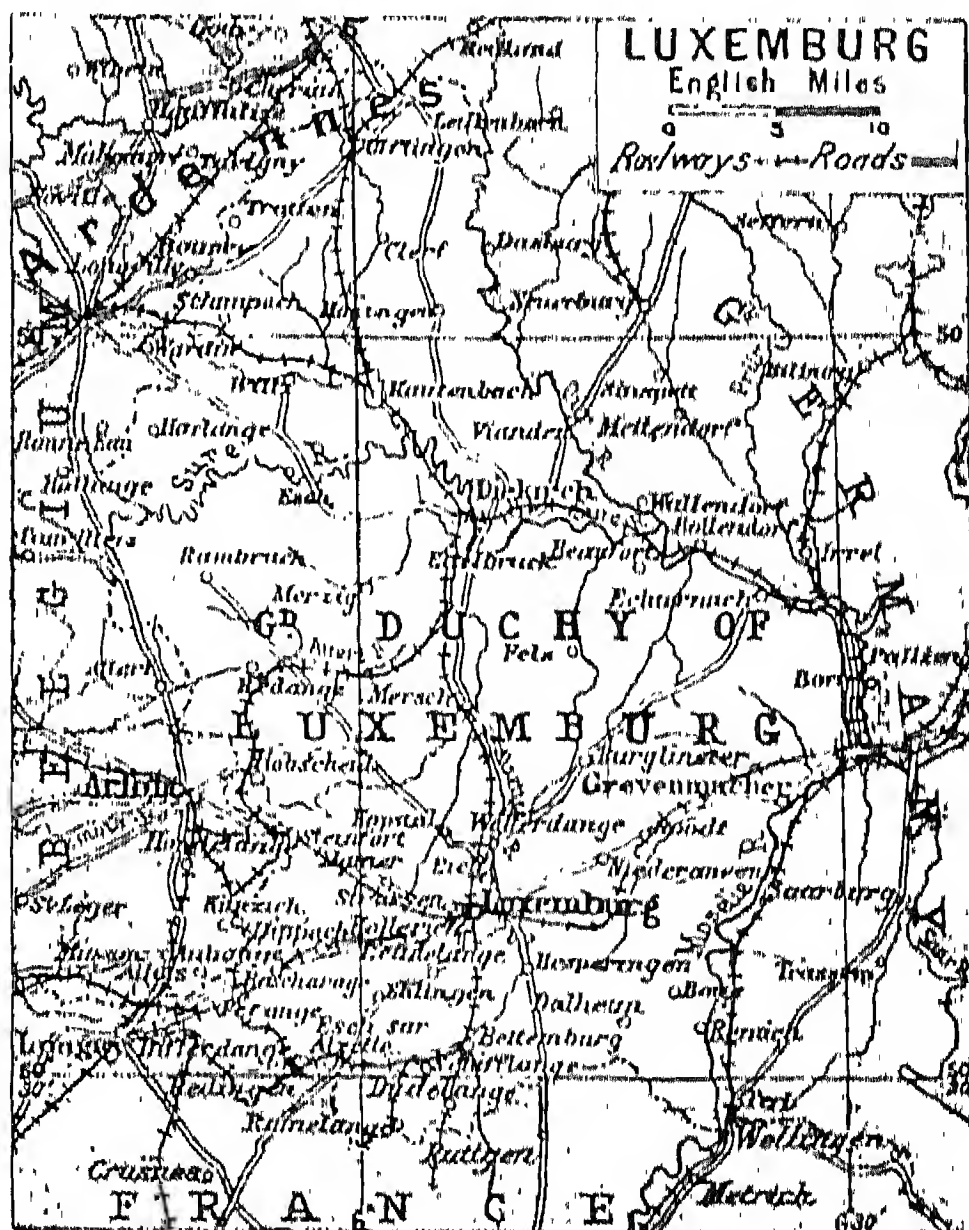
Luxemburg originated in a county, created in the 11th century, and taking its name from its chief town. Its counts became so important that in 1308 one of them, Henry, was chosen emperor, and in the 14th century the house of Luxembourg was one of the chief families of Europe. To it belonged John, king of Bohemia. In 1444 the duchy, as the county had been since 1354, became part of Burgundy and thus later passed to the emperor Charles V. It was a possession of his descendants, the kings of Spain, from 1555 to 1713, when it passed by arrangement to Austria. The French conquered it 1795.

The congress of Vienna, 1815, made it a grand duchy, and gave it as a personal duchy to William I of the Netherlands in exchange for the Orange-Nassau possessions in Germany. In 1830

Luxemburg, like the S. Netherlands, rebelled against William; and when in 1839 the powers recognized Belgium as a separate country, French-speaking W. Luxembourg (see Luxembourg) was given to her, E. Luxembourg remaining a grand duchy with William as its duke. This grand duchy, the present Luxembourg, joined the German customs union in 1842. During 1815-66, the grand duchy, large or small, was a member of the German confederation. In 1867, by the treaty of London, the powers declared it independent, and guaranteed its neutrality.

On the death of William III in 1890, the Netherlands passed to his daughter Wilhelmina; but at that time succession in Luxembourg was restricted to males, and the grand duchy went to Adolphus (d. 1905), a member of the elder branch of the house of Nassau. He was succeeded by his son William (d. 1912), and when it became apparent that with him the male line of the Nassau family would end, a law was passed allowing the accession of females. Charlotte (b. Jan. 23, 1896), second of William's six daughters, became grand duchess on the abdication of her sister Marie, Jan. 9, 1919.

Although Germany was among the signatories of the treaty of London, 1867, she invaded Luxembourg, simultaneously with her attack on Belgium, in 1914. A de-



Luxemburg. Map of the grand duchy, showing its position between Germany, France, and Belgium

tachment of German troops tore up the rails at Trois Vierges on Aug. 1, 1914, and during the night strong forces entered Luxemburg, asserting that the French were marching against it. A proclamation announced that the occupation would be only provisional; personal and religious liberty would be respected; iron discipline of the German occupying forces would be maintained, and all requisitioned goods paid for in cash. The Germans broke all their promises. Luxemburgers were seized as hostages, forcibly enrolled in the German army, condemned to death for alleged offences, though as far as is known none was executed. The country was stripped of food and raw materials, and was not evacuated until the armistice, Nov. 11, 1918.

By the treaty of Versailles, Luxemburg ceased to belong to the German customs union. In 1921 it concluded a customs union with Belgium.

The Germans again invaded undefended Luxemburg on May 10, 1940. The standing army of 250 could offer no resistance, and ruler and govt. fled to France, then to Canada, and in 1941 went to London. On July 28, 1940, a German civil governor of Luxemburg was appointed. The German language was made compulsory; Luxemburg was again included in the German customs union; and the Nazi system of education was introduced. On Aug. 30, 1942, the grand duchy was annexed to the Reich. The people endured worse hardships than in the First Great War; young men were called up for German labour service or service in the army, and one in ten of the pop. was sent to forced labour or a concentration camp.

On Sept. 10, 1944, troops of the U.S. 1st army crossed the frontier, the Germans retiring before them. They liberated the city of Luxemburg intact the same day. The German counter-offensive in the Ardennes (*q.v.*) made part of Luxemburg the scene of bitter fighting, Dec., 1944–Jan., 1945, and delayed the return of the grand duchess until April. During the Second Great War, Luxemburg changed from a rich to an impoverished country, with thousands homeless, and a third of the land devastated.

In Sept., 1945, Luxemburg was given a zone of occupation in the Eifel dist. of Germany.

The Luxemburg govt., during its exile in London, entered in 1944 into a convention with the Netherlands and Belgian exiled govts. for a post-war customs union of the three countries. Ratification in 1947 brought the "Benelux" customs union into formal existence on Oct. 29 (*see* Benelux).

Luxemburg participated in the European Recovery Programme, in the Brussels treaty, 1948, and in the North Atlantic treaty, 1949.

Luxemburg. Town and capital of the grand duchy of Luxemburg. It stands on the Alzette. The chief

buildings are the churches of S. Michael and Notre Dame and the palace. The church of S. Quirinus is hewn out of solid rock. At one time Luxemburg was regarded as one of the strongest fortresses in Europe, but its fortifications were destroyed in 1867. The chief industries are iron

and steel working, brewing, and tanning. The town lies partly in the valley, with the older portion of the plateau above, and many streets zig-zag up the slopes or ascend by steps. The name means little town. Pop. (1956) 68,032.

Luxemburg, Rosa (1870–1919). German socialist. Of Jewish origin, she was born at Zamosc, Russian Poland, March 5, 1870, niece of a founder of the Bank of Poland. Having studied economics at Zürich, she became a professor in economic science, but getting into trouble with the authorities, escaped deportation to Siberia by flight to Berlin, where in 1898 she married Gustav Lübeck to secure German citizenship. Professor of economics in Berlin, she won notoriety as Red Rosa. She joined forces with Karl Liebknecht and was the founder of Polish social democracy. A cripple, small of stature, but a speaker and writer whose violence was almost equalled by her ability, she was long on the editorial staff of *Vorwärts*. During the First Great War she was imprisoned for anti-militarism. Liberated after the revolution of Nov., 1918, she took a leading part in the Spartacist (Communist) movement and, being arrested with Liebknecht in Berlin on Jan. 15, 1919, by a patrol of the

civic guard, was killed, it was believed, by the mob. Her study of the Russian revolution, which had been the inspiration of the movement she led, was feared 1922. *See* Spartacista.

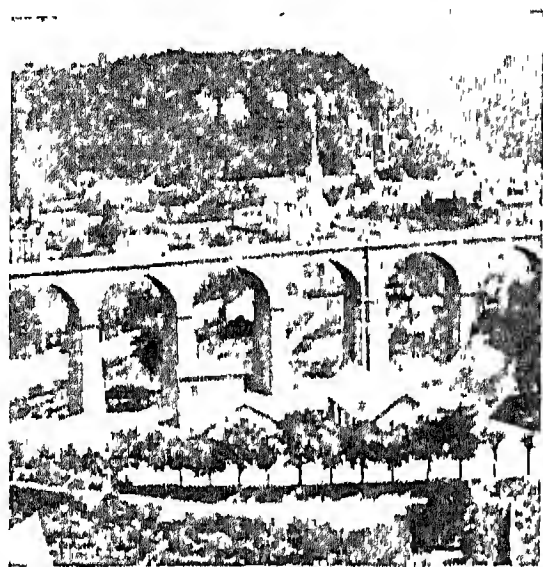
Luxeuil. Town of France, in the dept. of Haute Saône. It is 10 m. N.W. of Laure, at the base of the Vosges. The mineral baths were known to the Romans. There are a fine 11th century church and ruins of a monastery founded in 590 by S. Columbanus.

Lux Mundi (Lat., light of the world). Name given to a collection of theological essays published in 1889. The editor was Charles Gore, then head of Pusey House, Oxford, who wrote one on The Holy Spirit and Inspiration. The book was an attempt to permeate the high church school with the results of modern Biblical criticism, and as such was violently assailed by the more conservative churchmen.

Luxor (Arab. el Qusar, the palace). Town of upper Egypt. Situated on the E. bank of the Nile, 418 m. by railway S.S.E. of Cairo, it gives its name to the Luxor dist. of the Qena prov. It is a winter resort, and the tourist centre for the Theban plain.

Luxor, with the adjacent Karnak, comprises the ancient city of Thebes. The two parts were connected by a paved avenue $1\frac{1}{2}$ m. long, flanked by stone sphinxes. The Luxor temple, 862 ft. long, built by Amenhotep III, c. 1400 B.C., in honour of Amun, Mut, and their son Khons, was called the Harem of Amun, and was visited annually by the god's statue in great pomp. It comprises a court 148 ft. by 168 ft., with double rows of clustered papyrus columns on three sides, confronting a vestibule whose roof was supported by 32 similar columns. Beyond this a group of smaller chambers included a sanctuary for the sacred barque and another which was converted into an early Coptic church. In front of the court is a colonnade of 14 columns 52 ft. high.

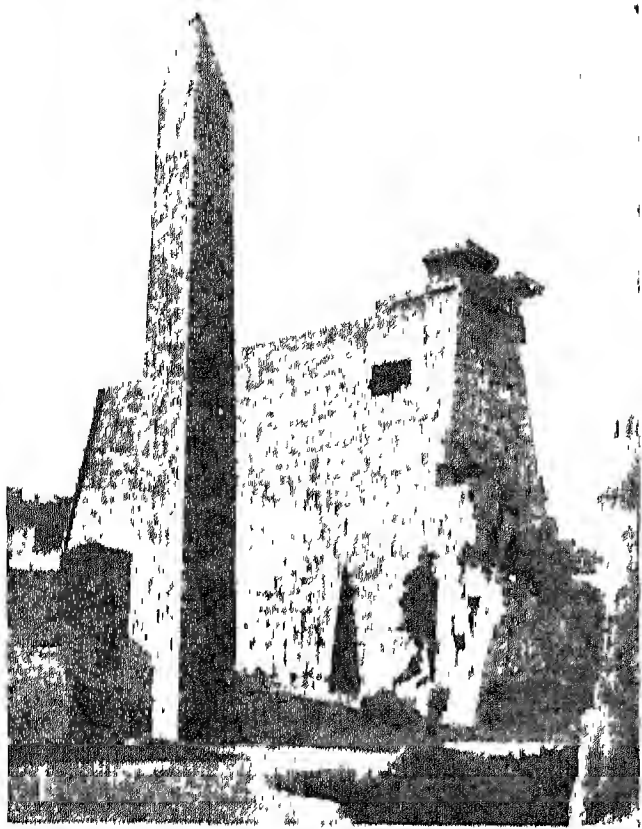
Before the original time Ramesses II erected a court, 187 ft. by 168 ft., surrounded by 74 papyrus columns. One corner of the court is occupied by the 7th century tomb mosque of the Muslim saint Abu'l Haggag, whose annual festival, with its procession of boats, echoes the ancient festival of Amun on the same spot. Standing colossi of the king are placed between some of the columns, and seated figures of himself and his



Luxemburg. Great viaduct, built in 1861 across the Pétrusse valley

queen flank the portal. The massive pylon is sculptured with reliefs depicting the Hittite campaign, and with the poetical narrative of the Kadesh battle called the epic of Pentaur.

In front of the pylon stood six colossal statues of Rameses II, of which three only are preserved.



Gard, Aug. 5, 1578, as a young man he was intimate with Louis XIII. In 1617 he helped the king in the intrigue against the queen mother, Marie de

Medici, being largely responsible for the assassination of her favourite, Concini. His influence over Louis was supreme, and after negotiating the treaty of Angoulême, 1619, and suppressing a Huguenot rebellion, he became constable of France, 1621. At once he undertook a campaign against the Huguenots, but rapidly succumbed to a fever on Dec. 14.

Luz (Heb., almond tree). In the O.T., the old name for Bethel.

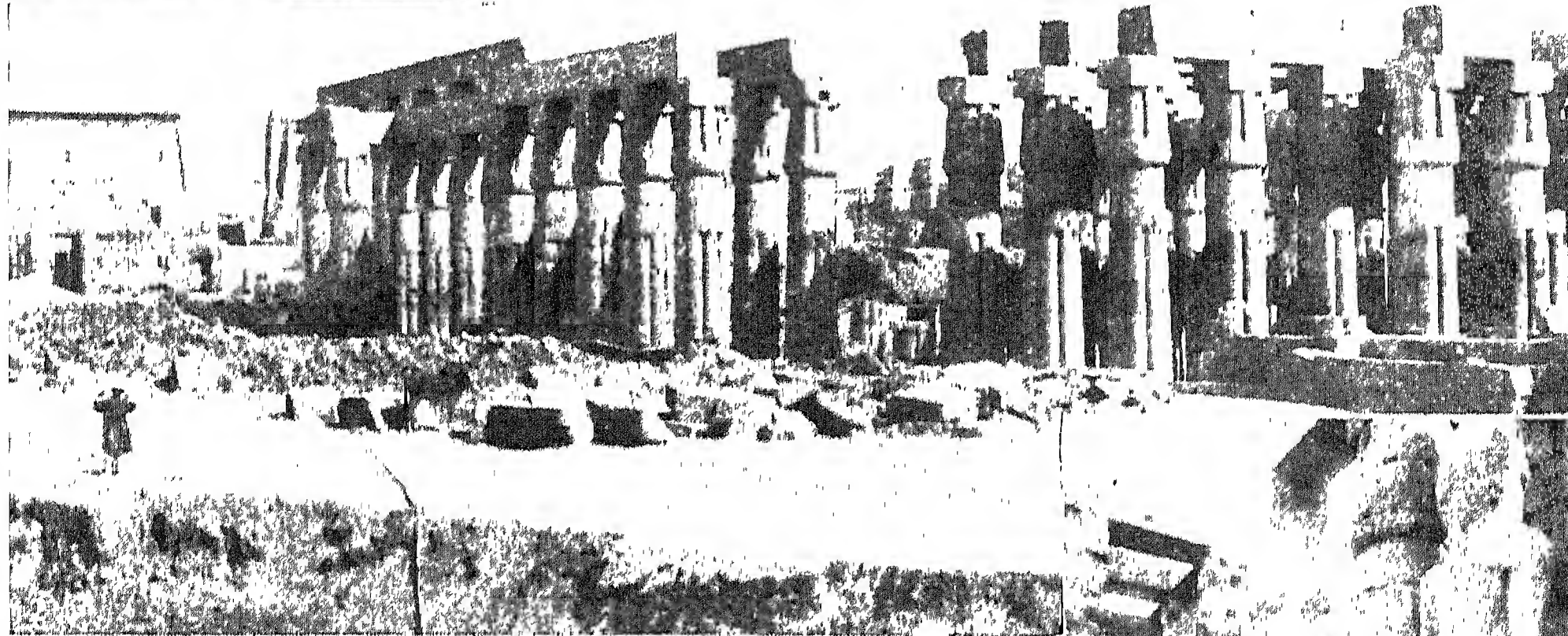


Duc de Luynes,
French courtier

river. W. of the valley the Zambales range has a mean elevation of 4,000 ft.; E. of it the Eastern Cordillera, called in its N. portion the Sierra Madre, lies close to the coast, and is continued through the isthmus to the S.E.; N.E. of it the Caraballos Sur connects the S. ends of the Sierra Madre and the Caraballos Occidentales.

The S. peninsulas have a backbone of high ground, from which rise isolated peaks, of which the important is the still active volcano of Mayón, a perfect cone, 7,916 ft. high. The land rises steeply from the coasts, and the coastal slopes on the E. receive annual rainfall of over 100 ins.

Luzon was settled by Spaniards in the 16th century and was a Spanish colony until 1898, when it was ceded to the U.S.A. In 1946 it became part of the newly-formed Philippine republic. The



Luxor, Egypt. 1. Obelisk of Rameses II. 2. Colonnades in the Court of Amenhotep III. 3. Colossal statues of Rameses II, between the columns of his courtyard

Of the two pink granite obelisks one, 82 ft. high, remains; the other stands in the Place de la Concorde in Paris.

Luxullianite. Rock of striking aspect found near Luxulyan, Cornwall, England. It consists essentially of pink potash-feldspar, black tourmaline, and quartz. A normal porphyritic granite with feldspar, mica, and quartz was attacked by boron-rich fluids which introduced tourmaline at the expense of original mica and some of the feldspar. Luxullianite has been used as an ornamental stone and is of petrologic interest, but little now remains.

Luynes, CHARLES D'ALBERT, Duc DE (1578-1621). French courtier. Born at Pont St. Esprit.

or of a village near it on the boundary of Ephraim. It was also that of an unidentified Hittite city.

Luzon. Largest of the Philippine islands. It consists of two sections, one, roughly rectangular, lying N.-S., and the other, an irregular group of connected peninsulas, lying E. and S.E. of Lamón Bay. With an area of 40,420 sq. m., it is 138 m. at its widest point and 8 m. at its narrowest.

In the N. section a valley, 150 m. long and 50 m. wide, extends from Lingayen Gulf to the lake Laguna de Bay. On the W. coast is Manila Bay, the best harbour in the Far East, which has an area of 770 sq. m., and a maximum depth of 150 ft. Connecting Laguna de Bay and Manila Bay is the Pasig

island is divided into 24 provinces and has a pop. of 3,800,000, of whom some 200,000 remain pagan and uncivilized. The population is of mixed race, ranging from the westernised Tagalogs to the Negritos, a tribe of pygmy head-hunters in the N. English or Spanish is spoken by the majority of the people, but the official language, like that of the rest of the



Philippines, is based upon Tagalog, a Malayan dialect. Tobacco, cotton, hemp, copra, rice, sugar, cacao, pineapples, and bananas are the principal agricultural products; there is considerable cattle raising to the S.W. of Laguna de Bay.

Manila, capital of the Philippines, and Quezon City, site of govt offices, both lie in Luzon.

Baguio is the centre of the gold-mining area. Copper, iron, and coal are also mined. In the central area of the W. coast is a chrome deposit, estimated to be the world's largest, which has not yet been developed.

Gen. MacArthur was in command of combined Filipino-U.S. defence forces on Luzon when the Japanese invaded it on Dec. 10, 1941. He succeeded in holding the enemy in check until Dec. 22, when some six to eight Japanese divs. landed in Lingayen gulf, followed by steady reinforcements. Manila, declared an open city Dec. 25, bombed severely from the air next day, was entered by the Japanese, Jan. 2, 1942, U.S. and Filipino forces having retired to Bataan pen., where they held out until April 10, and the island of Corregidor, which surrendered only on May 6. U.S. forces returned to Luzon on Jan. 9, 1945, recapturing Manila in a battle lasting from Feb. 4 to 24. Isolated groups of Japanese were still holding out in the Sierra Madre when Japan surrendered in Aug. Luzon, particularly Manila and its neighbourhood, suffered terrible devastation during the fighting. For a fuller account of the war in the Philippines, see *Pacific War*; see also *Bataan*; MacArthur, D.

Lvoff, GEORGE EUGENIEVICH, PRINCE (1861-1925). A Russian politician. Born Oct. 21, 1861, and educated at Moscow University, he devoted his energies to educating the peasantry. In the famine year of 1891 he served on relief committees, and during the Russo-Japanese War was head of the Red Cross organization in Manchuria. In 1904 he came into prominence in connexion with the Zemstvo congresses which started the constitutional movement. To the first Duma he was returned as a leader of the Constitutional Democratic party known as the Cadets. For signing the manifesto at Viborg calling upon the people to refuse taxes, he was debarred from sitting. Prime minister in the provisional government 1917, he resigned owing to differences with the Socialists on the land question.

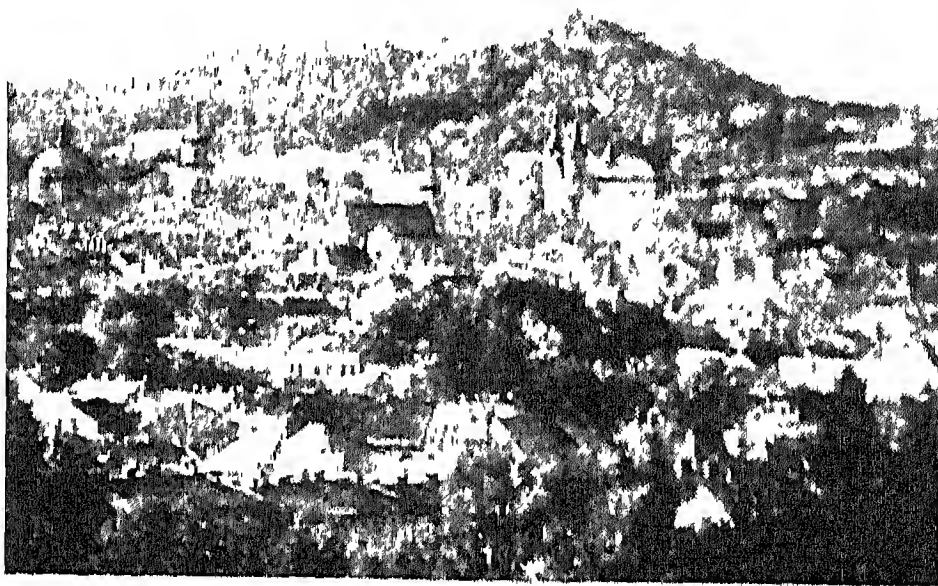
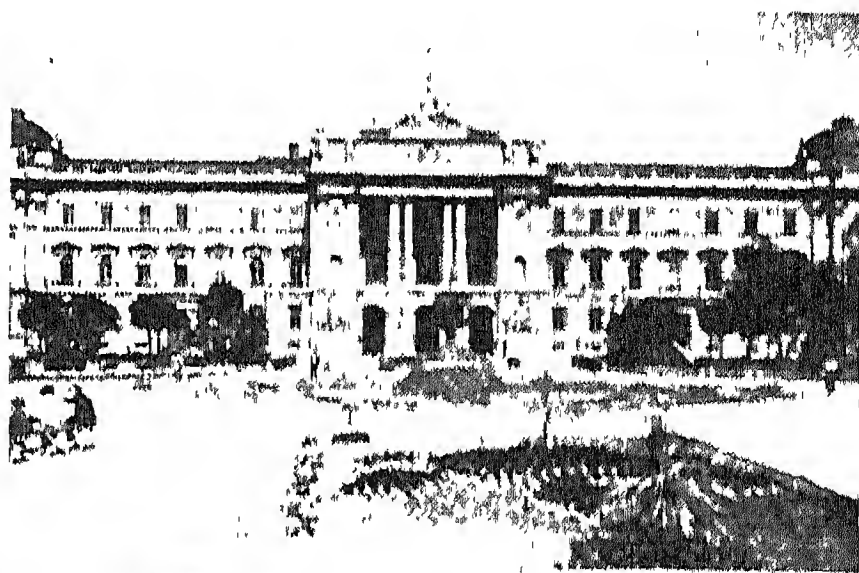
He left Russia on the advent of the Soviet regime, visiting Britain and the U.S.A., and died March 7, 1925.

Lvoff, ALEXIS FEODOROVICH (1799-1870). Russian composer. Born June 6, 1799, he entered the army and attained the rank of general. Meanwhile he had given much time to music, and in 1836 succeeded his father as director of music at the imperial chapel, St. Petersburg. He was an excellent violinist and is remembered as the composer of the pre-revolutionary national anthem of Russia. He died Dec. 16, 1870.

Lvov (Polish Lwow; German Lemberg). City of the Ukraine S.S.R. which also gives its name to a region. Lvov, which means the City of Lions, lies in the eastern district between the San and Zbruecz rivers. Situated between two low ridges on the great east-west route from Cracow to Kiev, it was the capital of Red Ruthenia, part of the early Polish

whelmingly Ukrainian in population, the city remained predominantly Polish. At the partition of Poland in 1772 Lvov was renamed Lemberg and became capital of the Austrian province of Galicia.

Lvov was the scene of bitter fighting in the First Great War, the first battle for it lasting from Aug. 31 to Sept. 2, 1914, when it fell to the Russians with 100,000 prisoners. Restoring its old name of Lvov, the Russians set up an administration, but in June, 1916, it was reoccupied by the Austrians during Mackensen's advance. Frequent riots occurred in 1917 and 1918, fomented by separatists, but the city passed into Russian



Lvov, Ukraine S.S.R. Partial view of the city with the hill Wysoki Zamek in the background. Above, right, main university building, formerly the Galician Diet

state, until it passed under the rule of the duchy of Kiev in the 10th century. In 1240, Lvov was rebuilt and fortified by Danilo, duke of Kiev, as part of the defence system against the Tartar invasion. It was reunited with Poland in 1340 and further fortified, while a natural barrier of hills made it practically inaccessible from the east. It became one of the bastions of western civilization, and successive invasions by Tartars, Turks, and Cossacks were halted at its walls.

In 1380 it was granted the right of emporium, or free trade, and in the middle ages it became an important trading centre, its population including Germans, Greeks, Jews, Tartars, and Armenians. Although in a territory over-

population until 1921, when it was ceded to Poland.

Under Polish rule, Lvov was further developed as a cultural and commercial centre and became a link between eastern and western Europe. By 1931 its pop. had reached 312,000. Even under foreign domination

it had been a centre of Polish learning, the university having been established in 1634, while the Lvov Polytechnic was the oldest Polish technical institution. The Ossolineum library contained over a million volumes and there were numerous museums and theatres. It was the seat of three archbishops, Roman Catholic, Greek Orthodox, and Armenian Catholic. There were also a number of synagogues, most of them masterpieces of internal architecture. Under the Poles, considerable industry was established.

At the outbreak of hostilities between Germany and Poland on Sept. 1, 1939, Lvov was subjected to three days' intensive air attack, devastating the principal buildings and large areas of the city.

Surrounded on Sept. 19, the city capitulated three days later when the Jewish population was annihilated. In the partition of Poland between Germany and Russia, Russia secured Lvov. Following Germany's attack on Russia, it was taken by the Germans on June 30, 1941. Recaptured by Ukrainian forces of the Red army on July 27, 1944, it was ceded to the Ukraine S.S.R. under the Russo-Polish treaty of Aug., 1945. Pop. (1956 est.) 387,000.

Lyall, Sir ALFRED COMYN (1835-1911). A British administrator. Born at Coulsdon, Surrey, Jan. 4, 1835, he went to Eton and Haileybury, entered the Indian civil service, 1856, and served during the Mutiny. Minor appointments led to his becoming lieutenant-governor, N.W. Provinces and Oudh, 1882-87, and then a member of the India council in London until 1902. Lyall founded the new university of Allahabad, 1887. Knighted in 1881, he died at Farringford, I.O.W., April 10, 1911. His series of Asiatic Studies, 1882-99, were remarkable for their insight into Indian native rites and customs and for their value to the student of religion and mythology.

Lyall, EDNA. Pseudonym of Ada Ellen Bayly (1857-1903), a British novelist. Born at Brighton,



Edna Lyall,
British novelist
Elliott & Fry

March 25, 1857, she became an active social and religious worker. Among her novels are *Won by Waiting*, 1879; *Donovan*, which made her name, 1882; *We Two*, 1884, in which Charles Bradlaugh is thinly disguised; *Doreen*, the hero of which is Michael Davitt, 1894; *The Hinderers*, 1920. A woman of strong political convictions, she was a keen Home Ruler and supported Bradlaugh in his contest with the house of commons, though she had no sympathy with his religious views. She died Feb. 8, 1903.

Lyautey, LOUIS HUBERT (1854-1934). French soldier and administrator. Born at Nancy, Nov. 17, 1854, he passed through St. Cyr and in 1875 joined the army as a lieutenant of *chasseurs*. He was on active service in Algeria, 1880-82; Tongking, 1894-97; and Madagascar, 1897-1902. Then he was in Algeria, 1903-11, becoming general of division in 1907.

He was resident commissary-general in Morocco, 1912, and held the post until 1925, with one interval in 1916-17 as minister of war. In 1921



L. H. Lyautey,
French soldier

Lyautey received his marshal's baton without having ever served in France. He built up a colony with a great economic future and was probably the outstanding figure in the creation of French Africa. On July 27, 1934, he died. A Maurois wrote his *Life*, Eng. trans. 1931.

Lycabettus. Hill in Greece. A conical rock to the N.E. of the city of Athens, it is 900 ft. above sea level. On its S.W. slope an aqueduct, constructed by Hadrian and Antoninus Pius and repaired during the 19th century, is still used for the water supply of Athens. The modern name is Mount St. George (Ha ios Georgios), to whom a chapel on the summit is dedicated. See Athens.

Lycanthropy (Gr. *lykos*, wolf; *anthrōpos*, man). Term for the power popularly attributed in some countries to certain persons of turning themselves into wolves. In Great Britain such persons were known as were-wolves. The term is also used in folklore in a wider sense for the supposed transformations of men and women into other beasts, as bears or foxes. In pathology, lycanthropy is a form of mental disease in which the patient believes himself to be an animal and generally behaves like one. See Were-wolf.

Lycaon. In Greek mythology, a king of Arcadia, noted for his impiety. Zeus came down to earth to visit him, and Lycaon, to test his divinity, had the effrontery to offer him a dish of human flesh. For this insult he was changed into a wolf, as were all, save one, of his 50 sons.

Lyconia. Ancient district of Asia Minor. It was bounded N. by Galatia, W. by Phrygia, S. by Cilicia, and E. by Cappadocia. Its capital was Iconium, and its other chief towns were Derbē, Lystra, and Laodicea, all of which figure in the N.T., Acts 14, etc. It is part of the Turkish vilayet of Konieh.

Lycastē. Genus of handsome orchids. They are natives of tropical America. Some species grow in the ground, others on trees. The lip of the flower is furnished with a transverse fleshy appendage. *L. skinneri*, from Guatemala, has

large, white, solitary flowers (4 to 6 ins. across) suffused and blotched with rosy-crimson. See Orchid.

Lycée (Lat. *lyceum*). The name given in France to secondary schools under state control.

Lyceum. Gymnasium sacred to Apollo Lycius. Just outside the city of Athens on the S.E. side, it was famous as the place where Aristotle and his successors taught their philosophy. Hence the name was applied to the school in which Aristotelian philosophy was taught, and is now used for various educational institutions.

Lyceum Theatre. A former London playhouse in Wellington Street, Strand. On this site, purchased in 1765, the architect, James Payne, erected a building to house the exhibitions of the newly incorporated Society of Artists; the

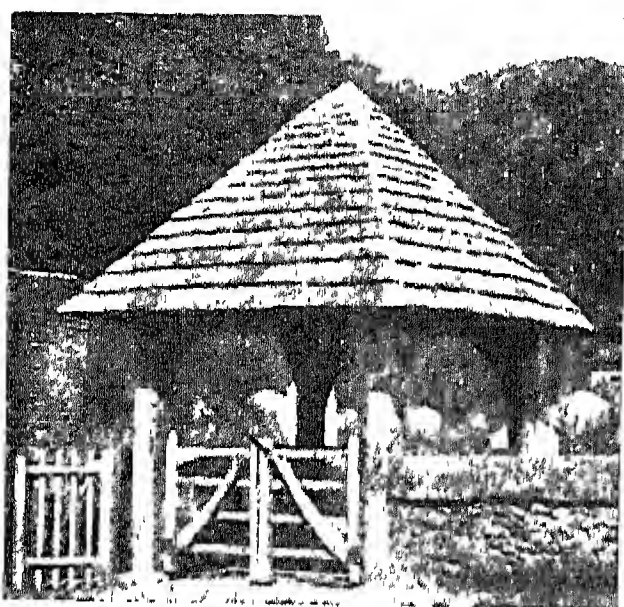


Lyceum Theatre. The former London playhouse made famous by Irving, and in 1945 converted into a dance hall

society became insolvent, and the building was sold and the back part converted into a theatre. Various entertainments were given in the place, including, in 1802, Madame Tussaud's first exhibition of wax-works. In 1809 the theatre was licensed and renamed the English Opera House. It was rebuilt in 1816 and burnt down in 1830.

Another theatre was put up on the site and opened in 1834, with opera. Balfe, the Keeleys, Fechter, and the Batemans were among those in management here, but the house is chiefly associated with Irving, who was its manager 1878-1902, and in conjunction with Ellen Terry made it world-famous by his Shakespearian productions. Irving's last performance here took place July 19, 1902. The theatre was then entirely reconstructed, and the new building, with the

old façade preserved, was opened in 1904. From 1907 The Lyceum was the chief home of melodrama in London under the management of the brothers Walter and Frederick Melville. It had a lavish annual pantomime. Its last night was March 11, 1939. Bought by the L.C.C., its site was to have formed part of a traffic roundabout, but the project was held up by war, and in 1945 The Lyceum reopened as a dance hall.



Lych-Gate. Examples from Surrey churches. Left, Shere; right, Chiddingfold, restored Frith

Lych-Gate (A.S. *lic*, body). Roofed gate at the entrance to a churchyard. At a funeral the coffin here awaits the officiating clergyman. A number of churchyards in England retain their old lych-gates.

Lychnis. Genus of plants of the family Caryophyllaceae. Five species are known in Great Britain, the commonest of which are the campion (*q.v.*) and ragged robin.

Lychnoscope. Small window (sometimes termed a low side window) near the west end of the chancel of a church, inserted lower than the other windows to permit communication between a person outside and the priest within. Originally this was unglazed and fitted with a shutter.

Lycia. Ancient country of Asia Minor. On the S. coast, it was bounded N. by Phrygia, W. by Caria, and E. by Pamphylia. Xanthus was the capital. According to tradition the inhabitants came originally from Crete. The Homeric hero Sarpedon is a Lycian. The people successfully resisted the Lydian empire of Croesus, but were conquered by Harpagus, the general of Cyrus. Persian sovereignty, however, was nominal, and with the rise of Athens the Lycians became members of the Athenian League. When Alexander became master of the world, Lycia was incorporated in Syria, but retained much of its independence, even after the Romans conquered the

East. In the time of the Roman emperor Claudius (A.D. 43) it was united with Pamphylia.

Lycidas. Elegiac poem by John Milton, published in 1638. Written in Nov., 1637, in memory of his friend Edward King, drowned in the Irish Sea, it is one of the most beautiful of Milton's works, yet it was censured by Dr. Johnson for want of sincere feeling. It abounds in quoted phrases like "fresh woods and pastures new"; "fame

is the spur"; "the hungry sheep look up and are not fed."

Lyck (Pol. Elk). Town of the former East Prussia, incorporated in Poland in 1915 (see Masuria). It lies 115 m. S.E. of Kaliningrad. Lyck was the chief town of the Masurian Lakes district, situated on the Lyck lake and river. Castle ruins testify to its importance during the rule of the Teutonic Order. A rly. junction and a garrison town, it has some industry and an agricultural trade. The town was assaulted and severely damaged in bombardment in 1914 by the Russians, who occupied it in Aug. and in Oct.; but during the Masurian battle of Feb., 1915, they withdrew defeated. In Feb., 1945, after heavy fighting, it again fell to the Russians.

Lycomedes. In Greek mythology, king of the island of Seyros in the Aegean. To him Achilles was entrusted by his mother Thetis, who desired to keep him from taking part in the expedition against Troy, in which she knew he was foredoomed to be killed.

Lycoperdon. Scientific name for a genus of gasteromycetous fungi. See Puff-ball.

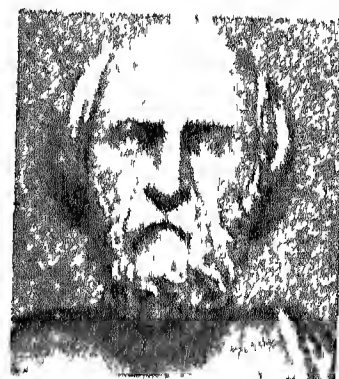
Lycophron (3rd century B.C.). Alexandrian poet and grammarian. A native of Chalcis in

Buboea, he flourished at Alexandria during the reign of Ptolemy Philadelphus, who gave him a post in the library. He wrote an essay on Comedy, several tragedies, and a poem on Cassandra, containing 1,500 lines in iambic metre, which is remarkable for the obscurity of its language, but of little value as a poetical effort.

Lycopodiaceae. A family of Pteridophytes, also known as club-moss (*q.v.*).

Lycurgus (c. 396-323 B.C.). Athenian statesman and orator. With Demosthenes and Hyperides he belonged to the national party at Athens which opposed all encroachments on the part of Macedonia. For 12 years he administered Athenian public finance with conspicuous success. Besides reorganizing the navy, repairing the dockyards, and completing the arsenal, he did much to improve and beautify the buildings of the city. As an orator he was lofty in tone, but his speeches lacked polish; 15 in number, only that against Leocrates has survived. See Philip, King of Macedonia.

Lycurgus (fl. c. 800 B.C.). Reputed founder of the constitution of Sparta. No authentic facts are known about him, but the tradition was that, after acting as regent for his young nephew King Charilaus, he left Sparta and travelled extensively. On his return he was called upon by the citizens to rescue the state from the confusion into which it had fallen. This he did with signal success, left the country never to return, and was worshipped as a god. Among the reforms attributed to him were the equitable division of the land among the citizens; the prohibition of gold and silver, and the substitution of iron as currency; establishment of the strict system of military training, common meals, and general education which gave Sparta military predominance in Greece and made her proverbial for courage and endurance.



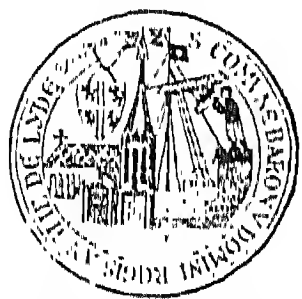
Lycurgus, reputed founder of the Spartan constitution

Lydd. Bor. of Kent, England, 72 m. S.E. of London. It includes the old town of Lydd, the fishing village of Dungeness, and the newly developed coastal areas of Greatstone and Lydd-on-Sea, and is well served by rly. and an airport. Lydd is a member of the



Lyck arms

Cinque Ports confederation, and a limb of New Romney. The chief building is the church of All Saints, an E.E. and Perpendicular edifice, the longest parish church in Kent, known as the cathedral of Romney Marsh.



Lydd borough seal

In early days Lydd was a fishing village, but the sea has receded and the old town is some 3 m. inland. Lydd is a permanent depot for the Brigade of Guards, and there are extensive small arms and mortar ranges, the explosive lyddite taking its name from here. The town first became a bor. in 1290; it was reconstituted in 1885. Pop. (1951) 2,774.

Lydda (Heb. Lod). Town of Israel. It stands on the plain of Sharon, 11 m. S.E. of Tel Aviv-Jaffa. It is said to have been founded by Shamed the Benjamite. According to legend, S. George was born and buried here, and his tomb is still shown. During the First Great War Lydda was captured from the Turks on Nov. 15, 1917. It is the principal airport of Israel, and the rly. station is the junction for Jerusalem and Tel Aviv-Jaffa. In 1944 it had only 9 Jews in a pop. of 17,616.

Lyddite. Name sometimes used in the U.K. for the high explosive trinitrophenol (*q.v.*) from the fact that the original experiments were conducted at Lydd, Kent.

Lydenburg (Afrikaans town of suffering). Town of the Transvaal, S. Africa. It is on the rly., 145 m. E.N.E. of Pretoria, and stands 4,820 ft. above sea level, among mountains which, in nearby Mt. Anderson, reach 7,490 ft. It was established by the Boers in 1849, and was the capital of an independent republic which in 1858 amalgamated with Utrecht republic, and shortly afterwards was included in the Transvaal. Lydenburg is a centre of alluvial gold mining, first worked long ago by the Portuguese. In 1875 the workings were rediscovered, and proved the most profitable field in Transvaal outside the Rand. The later discovery of platinum increased the town's importance. Pop. (1951) 4,634 (2,352 white).

Lydford or LIDFORD. Village and parish of Devon, England. It stands on the Lyd, 7 m. N.E. of Tavistock, and is served by rly. The chief building is the church of S. Petrock. Lydford was at one time an important place, owing to its proximity to the tin workings.

It was a borough in Anglo-Saxon times. After the Norman Conquest a castle was built here, and there was a market and a guild. Lydford became one of the chief of the stannary towns, the castle containing the stannary prison. Here were held the Dartmoor forest courts, at which summary justice is said to have been the rule. Lydford gorge is a beautiful ravine near by. Pop. (1951) parish, 2,071. See Lidford Law; Stannaries.

Lydgate, JOHN (c. 1370-1451). English poet. Born at Lydgate, Suffolk, he joined the Benedictine order at Bury St. Edmunds,



John Lydgate, English poet

being ordained deacon in 1393 and priest in 1397. He studied in Oxford and Paris. Court poet under Henry IV, Henry V, and Henry VI, he made the acquaintance of Chaucer about 1390, was prior of Hatfield Broad Oak, Essex, 1423-34, was pensioned in 1440, and, dying a poor man, was buried at Bury St. Edmunds. He wrote narrative poems, songs, fables, allegories, pageants, and is said to have written the prose work, *The Damage and Destruction of Realmes*, 1400. He also translated much Italian and French work, including some of Boccaccio. *The Temple of Glass*, ed. for the Early English Text Society, 1891, is an allegory in imitation of Chaucer's *House of Fame*. Lydgate enjoyed a great reputation after his death, but his work is chiefly interesting to students of language and metre.

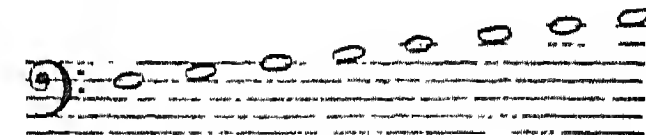
Lydia. Ancient country of Asia Minor. It was bounded N. by Mysia, E. by Phrygia, S. by Caria, S. and W. by the Aegean. In Homeric times it was called Maconia, but this name disappeared when about 675 B.C. Gyges (*q.v.*) killed the king Candaules and seized his throne.

The dynasty of Gyges lasted more than a hundred years, during which period Lydia became a great and prosperous state. It reached the zenith of its power under Croesus, to whose brilliant court at Sardis came distinguished men from all parts of Greece. Lydian civilization greatly influenced that of the Greek cities of Ionia, especially in music, literature, and the arts. Lydia was the first country to use coined money. Under Croesus the Lydian empire extended from the Aegean Sea to the

river Halys, and the Greek cities of Asia Minor were tributary. But in 546 B.C. Croesus went to war with Persia and was defeated, and Lydia became part of Cyrus's empire as the satrapy Sparda. The Lydians, their national spirit lost, acquired a reputation for luxurious effeminacy.

After the overthrow of the Persian empire by Alexander, Lydia became an independent kingdom again, but it subsequently became subject first to the kings of Syria, and then to those of Pergamum. In 133 it became part of the Roman province of Asia.

Lydian Mode. In music, an old Church mode beginning on F and using only the natural notes, *i.e.* the white keys of the pianoforte. The scale was:



with semitones between the 4th and 5th and 7th and 8th degrees. Its dominant was C. The Lydian mode was reputed by the Greeks to be soft and effeminate in its influence, and its use was discouraged in the training of the young.

Lydian Stone, BASANITE, OR TOUCHSTONE. A velvet-black siliceous stone or flinty jasper. It is a crypto-crystalline variety of quartz. If a precious metal be rubbed on the hard, black surface of lydian stone, the purity of the metal can be estimated by the colour of the streak it makes.

Lydney. Estate 9 m. N.E. of Chepstow, England, belonging to Lord Bledisloe. Excavations in 1928 and 1929 by R. E. M. (later Sir Mortimer) Wheeler and his first wife, on an earthwork here showed it to be a promontory fort of the late Iron Age (1st century B.C.). The hill was reoccupied in the 2nd and 3rd centuries A.D. by a Romano-British community working the local iron mines. In c. 364-367 a temple to the Celtic god Nodens was built within the old earthwork and was evidently a place of pilgrimage, for within its precinct were a large hostel and baths. The temple fell into disuse but the site remained occupied, though in a state of decay, during the 5th and 6th centuries. A hoard of 1,646 minute debased coins, barbaric imitations of Constantinian types, the smallest 2.5 to 3 mm. in diameter, was buried in one of the buildings during the 5th century.

Lydoch or LAIDON. Loch or lake of Scotland. It is in the district called the moor of Rannoch,

on the borders of Perthshire and Argyllshire. It is 5 m. long and is noted for its trout. The river Gaer carries its waters to Loch Rannoch.

Lye (A.S. *lēah*, cognate with Lat. *lavare*, to wash). Name given to a solution of alkaline salt, frequently sodium bisulphite, used for cleansing purposes. Originally the term was applied to the liquid obtained on lixiviating wood-ashes, which was also known as soap-lye because it was used in the manufacture of soap. Lye is used in petroleum refining, tanning, in the textile industry, in the removal of grease, and in the composition of acid-hypo fixing baths in photography.

Lyll, Mount. A peak of Tasmania, Australia, in Montagu co. It is in the N.W. of the island, and since its discovery in 1886 has become an important source of copper ore. Granite rock intruded into sedimentary strata and caused the accumulation of ore here, as it did in the neighbouring silver lead mines of Mt. Zeehan and tin mines of Mt. Bischoff. Mt. Lyell rises 2,750 ft.

Lyell, Sir Charles (1797-1875). A British geologist. He was born Nov. 14, 1797, at Kinnordy, Angus, the eldest son of Charles Lyell, botanist, and was educated at Midhurst and Exeter College, Oxford, afterwards entering Lincoln's Inn and being called to the bar. He devoted himself to geology, specialising in marine remains of the Tertiary period. He travelled widely in Europe, and the results of these tours appeared in *Transactions of the Geological Society*.

His chief work, *The Principles of Geology*, 3 vols., 1830-33, won for him the title of the father of modern geology. Its chief value was its demonstration that the forces which produced geological conditions of the past were still going on. Lyell was a firm supporter of Darwin's theories, as he showed in *Geological Evidences of the Antiquity of Man*, 1863. He occupied the chair in his subject at King's College, London, 1831-33, was twice president of the Geological Society, and president of the British Association. Knighted in 1848 and created a baronet in 1864, he died Feb. 22, 1875, and was buried in Westminster Abbey.



Sir Charles Lyell,
British geologist

Under his will the Lyell medal and fund were founded. *Consult* Life, Letters, and Journals, 1881.

Lyly or LILLY, JOHN (c. 1551-1606). English story-writer and dramatist. A native of Kent, he was educated at Magdalen College, Oxford, and was also a graduate of Cambridge. Settling in London 1577, he became a familiar figure at court, supervising the court entertainments, 1578-98. He took part in the Martin Marprelate (*q.v.*) controversy in a pamphlet, *Pappe with a Hatchet*, 1589, notable for its badinage and references to the stage attacks on Martin, and was M.P. for Hindon, 1589; Aylesbury, 1593 and 1601; and Appleby, 1597. Dying in London, he was buried in the church of S. Bartholomew the Less, Nov. 30, 1606.

First of the English writers of prose fiction, Lyly is chiefly remem-

bered as the author of *Euphues*, which gave the word euphuism to the English language. In two parts—*Euphues: The Anatomy of Wit*, 1579; and *Euphues and His England*, 1580—this work marks the beginning of the English novel of manners. Strong in feminine interest, it is composed in a style marked by erudite allusion, forced simile, and excessive antithesis, and vividly reflects the fashions of the time. Original in form, it is strung together by a slender love-story telling the adventures of a young Italian gentleman of wealth and position. Its dialogue is satirised in the speeches of Ben Jonson's Puntarvalo, Shakespeare's Don Armado, and Scott's Sir Piercy Shafton. It abounds in advice on friendship, love, education, and religion. Inspired by Spanish models, it had great influence on Lyly's contemporaries and ran into ten editions in 56 years.

Bibliography. *Dramatic Works*, ed. F. W. Fairholt, 2 vols., 1858; *Complete Works, with Life and Notes*, ed. R. W. Bond, 3 vols., 1902; *J. L. and Euphues*, C. G. Child, 1894; *J. L. and the Italian Renaissance*, V. Jellery, 1929.

Lyme Regis. Mun. borough, seaport, and watering place of Dorset, England. It stands on Lyme Bay, 23 m. W. of Dorchester,



Lyme Regis, Dorset. Promenade and foreshore of this picturesque watering-place

and is connected by a branch rly. line with Axminster. The church of S. Michael and All Angels is a fine Perpendicular building with a Norman tower. There is a guildhall, and a curved stone pier, forming the harbour, and called the Cobb, is an interesting relic and a popular promenade. There are delightful old houses and inns. Apart from the tourist business, the chief industries are shipping and stone quarrying. The name Lyme Regis was given to the place about 1300 when the manor became a royal manor. Up to the 11th cent. it was known as Lyme Abbas, and then as Nether Supra Lime. It was already known as a port and had received the privilege of a borough. It had a merchant guild, and from 1295 to 1867 was separately represented in parliament. It was a flourishing port up to the Middle Ages and in Tudor times, but began to decline when

the wool and textile industries went N. as a result of the Industrial Revolution. In 1685 the duke of Monmouth landed here. Lyme received several charters, but since 1834 has been governed by a mayor and corporation on modern lines. But the beauty of the town has altered little since Jane Austen described it in *Persuasion* (1816). The Cobb was the scene of Louisa Musgrove's accident in that novel. Jane Austen had stayed at Lyme with her parents in 1804. Pop. (1951) 3,191.

Lymington. Mun. bor., seaport and market town of Hants, England. The bor., which extends across some 25 sq. m., includes Pennington, Everton, Milford-on-Sea, Hordle, Ashley, Wootton, and Barton-on-Sea. The town of Lymington is a yachting centre, at the entrance to the Solent, 18 m. by rly. S. of Southampton. New Milton station is on



Lymington
borough seal



Lymington. The High Street of this Hampshire market town and yachting centre

the main line to London. Lymington is noted for the church of St. Thomas à Becket, which has an extensive gallery. It was a port by the 12th century and a corporate town by the 13th. For 300 years before 1885 it was separately represented in parliament; it is now in New Forest co. constituency. Market day, Sat. Pop. (1951) 22,674.

Lymm. An urban district of Cheshire, England. It is 5 m. E. of Warrington and 16 m. S.W. of Manchester. There are two rly. stations in the district, Lymm and Heatley. The church of St. Mary the Virgin is modern. In the centre of "the village" is an ancient cross, with stocks in front. The Manchester Ship Canal forms

the N. boundary of the district, while the Bridgewater Canal runs through the centre. Lymm is mainly residential, but salt is produced in Heatley. Pop. (1951) 6,410.

Lymph (Lat. *lymphā*, water). Fluid which exudes through the thin walls of the minute blood-vessels and comes into intimate contact with the tissues, to which it conveys nutriment. The lymph also gathers up from the tissues the waste products of their activity and passes into small vessels, the lymph capillaries, which open into the larger lymphatic vessels, joining a main trunk, the thoracic duct, which enters the blood-stream at the junction of the jugular and subclavian veins on the left side. There is a smaller duct at the right side. After a meal, the lymph in the thoracic duct is found to be milky in appearance, owing to the presence of fat, and is called chyle.

Lymphatic glands are bodies ranging in size from that of a hemp seed to that of a bean, through which the lymph vessels pass. Their function is to form some of the white corpuscles of the blood. They also act in a sense as filters by which bacteria and their toxins may be separated out. Hence lymphatic glands become enlarged in certain diseases of the blood, and a septic injury leads to their enlargement and perhaps suppuration, a protective mechanism.

Lympne. A village of Kent, England. It is 2½ m. W. of Hythe, and has an airfield notable since 1915, when the R.F.C. established a base for ferrying aircraft to France. After the First Great War, Lympne was taken over as a civil airport, with customs and other facilities. A fighter station for most of the Second Great War, it reverted during 1946-54 to civil use. Pop. (1951) par., 638. *Pron.* lim.

Lynceus. In Greek mythology,

one of the fifty sons of Aegyptus. He was spared by his wife Hypermetra, one of the fifty Danaïdes, in defiance of her father's instructions that each of his daughters should kill her husband on the wedding night. See Danaïdes.

Lynch, ARTHUR (1861-1934). British soldier of fortune. Born at Ballarat, Australia, he adopted a military career, and became in 1899 colonel of the Irish brigade which fought against the British in the S. African War. Elected Nationalist M.P. for Galway, 1901, he was arrested on coming to London to take his seat, and sentenced to death for high treason, commuted to penal servitude. Released in 1904, during the First Great War he was a colonel in the British army. He died in London, March 25, 1934. His books included *O'Rourke the Great*, 1922; *My Life Story*, 1924.

Lynch, PATRICIO (1825-86). Chilean sailor. Of Irish descent, he was born at Valparaíso, studied at the naval school at Santiago, and served in the war against Peru, 1838. Transferring to the British navy, he saw action in the China War, 1840-42, and afterwards returned to join the Chilean navy. Governor of Valparaíso in 1865, he commanded an expedition against Peru, 1879-80, and won fame at the battle of Chorrillos. Promoted admiral of the Chilean navy and commander-in-chief of the army, he died on returning from a mission to Spain.

Lynchburg. City of Virginia, U.S.A., in Campbell co. It is on the James river, 145 m. W.S.W. of Richmond, and is served by the Chesapeake and Ohio and other rlys. The city was named after the quaker, John Lynch, who established a ferry here in 1757; it was incorporated in 1852, having become the leading American tobacco market. Nearly 8,000,000 lb. of tobacco are marketed here annually.



Lympne, Kent. Parish church and, right, castle ruins

Lynchburg shoe factories are fourth in national importance. The leading educational institution is the Randolph-Macon college for women. Pop. (1950) 47,727.

Lynching. Infliction of the death penalty without a proper trial. Though far from unknown elsewhere, the practice of lynching is historically most closely associated with the U.S.A. The term is found in American publications early in the 19th century, but the theories of its derivation from a certain Judge Lynch in Virginia are entirely conjectural. It was originally applied to any kind of punishment inflicted by a self-constituted court without legal authority. During the settlement of W. America it was a common means of punishing horse-stealers and other offenders against the community, and often took the form of flogging or tarring and

man over the signature Y.Y. He wrote with unusual charm and distinction. His publications included



Robert Lynd,
British essayist

Portraits and Impressions, 1908; *The Art of Letters*, 1921; *The Peal of Bells*, 1924; *Dr. Johnson and Company*, 1928; *Life's Little Oddities*, 1941; *Things One Hears*, 1945. He died Oct. 6, 1949. His wife, Sylvia Lynd, *née* Dryhurst (1888-1952), whom he married in 1909, edited the *Children's Omnibus*, 1932; and her collected poems appeared in 1944.

Lyndhurst. Parish and village of Hampshire, England. It stands in the New Forest, 9 m. S.W. of Southampton, with a rly. station (Lyndhurst Road). It is a centre for visitors to the forest. The church of S. Michael and All Angels, which contains a fresco of The Ten Virgins by Lord Leighton, is fairly modern. Here is the King's House, containing a hall where the forest courts, or courts of Swainmote, meet. Pop. (1951) parish, 2,626.

Lyndhurst, JOHN SINGLETON COPLEY, BARON (1772-1863). British lawyer. Born at Boston, U.S.A., May 21, 1772, he was the son of the painter J. S. Copley (*q.v.*). Educated at Trinity College, Cambridge, he was a successful barrister when elected Tory M.P. for Yarmouth in 1818. Later he sat for Cambridge University and Ashburnham. Solicitor-general in 1819 and attorney-general in 1824, he was appointed lord chancellor and raised to the peerage in 1827. In 1830 he became chief baron of the exchequer, returning to the woolsack in Peel's ministries of 1834 and 1841-46. Lyndhurst usually

opposed reform, but stood and fell with his chief over the repealing of the Corn Laws. He was a vigorous speaker and a lucid expositor of legal matters. When he died on Oct. 12, 1863, the title lapsed. *Consult* *Life*, Sir T. Martin, 1883.

Lyndsay or **Lindsay**, **SIR DAVID** (c. 1490-1557). Scottish poet. Born near Cupar, he belonged to the famous Fife family, the head of which is the earl of Crawford. Educated at St. Andrews, he entered the royal household and was sent abroad on errands of state. He was a member of parliament and joined the reforming party when the Reformation began. His poems, which powerfully if coarsely exposed the corruption of the Church, are said to have done much to hasten the success of its teaching. They include the *Dreamer*, *The Historie of Squer Meldrum*, *The Monarchie*, and *Ane Satyre of the Thrie Estaites*, the last named being a satirical morality frequently acted in the open air. There is an edition of his works by D. Laing, 1879.

Lynmouth. Village and seaside resort of Devon, England. It stands at the junction of the E. Lyn and the W. Lyn, 18 m. N.E. of Barnstaple, at the base of a cliff, at the top of which stands Lynton. A cliff rly. connects Lynton and Lynmouth. In Aug., 1952, Lynmouth was devastated by floods that killed 31, destroyed



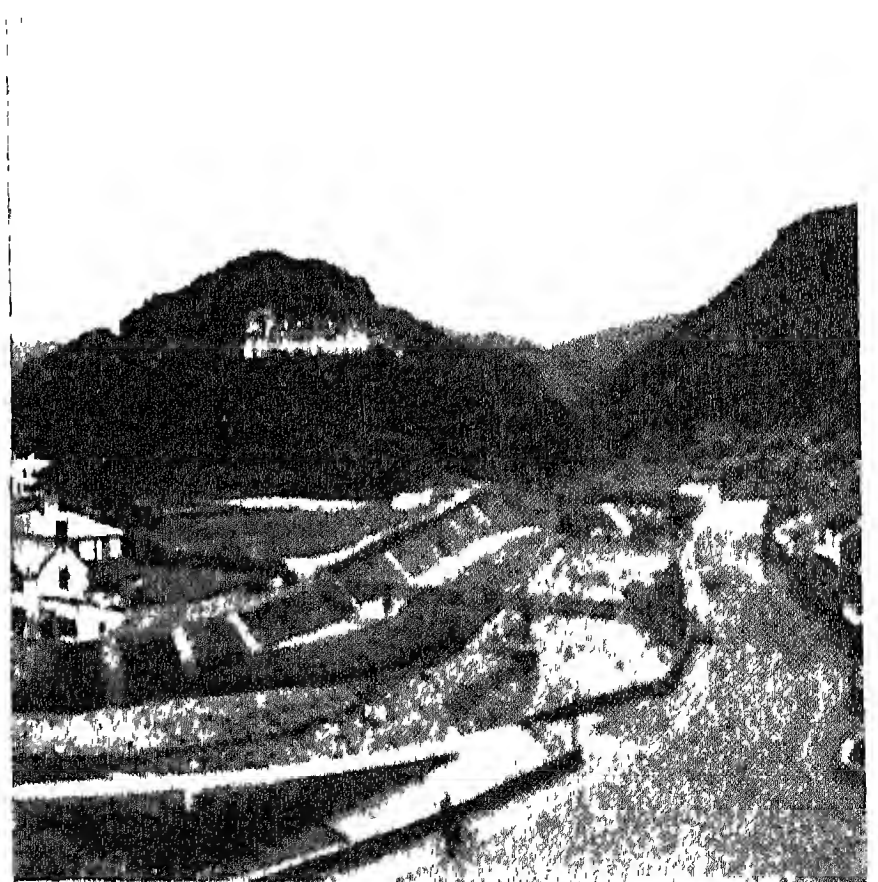
Sir D. Lyndsay,
Scottish poet
From a print, 1654



Lyndhurst. View of this Hampshire village, a centre for visitors to the New Forest

feathering. Recently the term has been confined to the death penalty, especially when inflicted by white mobs on negroes in the southern states. Many of these lynchings have been accompanied by the most brutal tortures. Attempts made from time to time to enact a federal anti-lynching law have been defeated by the representatives in congress of the southern states. Yet the number of negro lynchings in the U.S.A. shows a steady decrease from 106 in 1901 to one in 1945.

Lynd, ROBERT (1879-1949). British essayist. Born in Belfast, April 20, 1879, he was educated at Queen's College there. Joining the *Daily News* in 1912 on its amalgamation with the *Morning Leader*, he became its literary editor in 1913, retaining the position when the paper was merged with the *Daily Chronicle* to become the *News Chronicle*. For years he also contributed shrewd and quietly witty articles to *The New States-*



Lynmouth, Devon. The village and the river Lyn as restored after the devastation of 1952

the bridges over the E. and W. Lyn and 42 houses, and did much other damage. The damage was made good by 1955.

Lynn. City of Massachusetts, U.S.A., in Essex co. It is on Massachusetts Bay, 11 m. N.E. of Boston, and is served by rly. It has a secure but rather shallow harbour, and its many industries include the manufacture of boots and shoes, for which it is an important centre. There are foundries, electrical machinery shops, and patent medicine, leather, and box factories. The city has a fine city hall. In Lynn is the former residence of Mary Baker Eddy, founder of Christian Science. Lynn dates from 1629, then known as Saugus, and received its present name in 1673, after King's Lynn, Norfolk, England. It became a city in 1850. Pop. (1950) 99,738.

Lynn, RALPH (b. 1882). British comedy actor. Born in Manchester, March 18, 1882, he first appeared on the stage at Wigan in 1900, and made his London debut in *By Jingo*, 1914. Achieving fame in *Tons of Money*, 1922, he became one of the most popular entertainers of his time in a series of farces at the Aldwych Theatre (*q.v.*), where his monocle, toothy smile, and vague but genial air endeared him to the public. In film versions of these farces he had an immense following. A long run rewarded his reappearance on the stage in *Is Your Honeymoon Really Necessary?* 1944. *Outrageous Fortune* was produced 1947.

Lynn, VERA (b. 1917). British entertainer. The daughter of a plumber, Vera Welch was born at East Ham, March 20, 1917, and sang at charity concerts as a child. She made her first broadcast as a singer with Joe Loss's dance band, and later joined that of Ambrose. During the Second Great War, the "forces' sweetheart" entertained troops in India and Burma, flying some 20,000 m. Broadcasts in person and of her gramophone records of sentimental songs brought her a huge fan-mail.

Lynn Canal. Inlet of Alaska. It extends N. from Admiralty Island for about 100 m., and bifurcates at its head into the Chilkat and Chilkoot inlets. On the latter stands Skagway, and on the land tongue between the two is the small Chilkat village. The canal forms an important approach to the Klondike mining region.

Lynn Regis. See King's Lynn.

Lynton. Urban dist. and holiday resort of Devon, England, situated in the Lorna Doone country.

It stands on a cliff, 400 ft. above Lynmouth, a cliff rly. going from one to the other. It is 17 m. N.E. of Barnstaple. The church of S. Mary is an old building restored. From here coaches and cars go to places of beauty in the neighbourhood, such as Watersmeet and the Valley of the Rocks. Lynton and Lynmouth (*q.v.*) claimed to be the most beautiful places in England. Pop. (1951) 2,123.

Lynx (Lat. *lynx*). Genus of the cat family. It is distinguished by its heavy build, short tail, tufted ears,



Lynx. Specimen of European species

and bearded cheeks. It occurs in many parts of Europe, in Tibet, and in North America. Two species are found in Europe. The Northern lynx is found in Russia and Scandinavia, and rarely in Central Europe. It inhabited England in the Pleistocene period and its bones have been found in the N. counties. It is a forest animal, and an expert climber of trees. A fine specimen measures about a yard without the tail, which is about eight inches long. The thick and rather long fur varies in colour from grey to fawn, and in summer is spotted with black. In disposition savage, the lynx preys on birds and mammals, sheep and goats often being destroyed.

The Mediterranean lynx, found from Spain to Turkey, is a lighter and more handsome animal, the reddish coat being finely spotted and streaked. The Isabelline lynx of Tibet avoids the forests and lives among the rocks on open ground. It is paler in colour than the European species. The Canadian lynx, which is slightly smaller and ranges in colour from dark grey to almost white, is found in the forests, and preys mainly on hares and partridges. The bay lynx, reddish in colour, with large, black spots, occurs in the E. and S. states of the U.S.A., varying greatly in colour and markings in different districts.

Lynx. One of the constellations. Situated between the Great Bear and Cancer, it is very faint, and

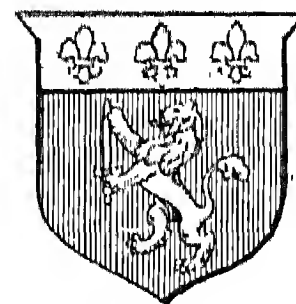
contains several well-known double stars. See Constellation.

Lyon. Old Scottish form of lion, used now in heraldry. The heraldic office for Scotland is called the Lyon Court, and its head is the Lyon king of arms. The office dates back to 1371, or earlier, and was named from the lion on the royal shield. The lord Lyon is assisted by three heralds, Rothesay, Ross, and Albany, and by three pursuivants, March, Unicorn, and Carrick. All arms or alterations thereon in Scotland must be entered in the Lyon court, where pedigrees are also recorded. The office is the Scottish equivalent of the Herald's College in England, but is a government office, all its fees being handed over to the Treasury. The Lyon king of arms is registrar of the order of the Thistle. See Heraldry; Knighthood; Thistle.

Lyonnesse. Name of a legendary country. It was believed to have lain off the coast of Cornwall, and to have disappeared under the sea; according to another legend it included Cornwall. The name appears in the old county of Léon in Brittany. Cornish and Breton folklore is full of references to this lost land, which also serves as the scene of events described in the Arthurian legends, notably in the stories of Tristan and Isolt.

Lyonnais. Former county of France, also a province until the Revolution. The county extended along the right bank of the Saône and Rhône, from Villefranche to Condrien below Vienne, with a small district on the left banks of both rivers around Lyons, the capital. It corresponds roughly with the S. half of the dept. of Rhône, with a small portion of Loire. The territory of the Gallie Segusii, it belonged in turn to the Burgundians, the Franks, the kingdom of Arles or Provence, from which it passed to the Empire, 1033, and became a possession of the archbishops of Lyons. Philip IV, the Fair, annexed it to France in 1312. The province of Lyonnais comprised the depts. of Rhône, Loire, Haute-Loire, and Puy-de-Dôme. See Lyons.

Lyons (Fr. Lyon). A city of France, fourth in respect of pop. (counting Algiers), and cap. of Rhône dept. It lies at the confluence of the Rhône and Saône, which divide the city into three main portions; the old town on the strip between



Lyons arms

the rivers, the quarters of Les Brotteaux and La Guillotière on the left bank of the Rhône, and those of Vaise, Fourvière, and St. Irénée, on the hills lying on the right bank of the Saône; La Croix-Rousse lies between the river to the N. The town is a rly. centre of great importance, 317 m. from Paris *via* Dijon, has seven passenger stations and by its position on the two navigable rivers, lined with busy quays, has a large volume of waterway traffic.

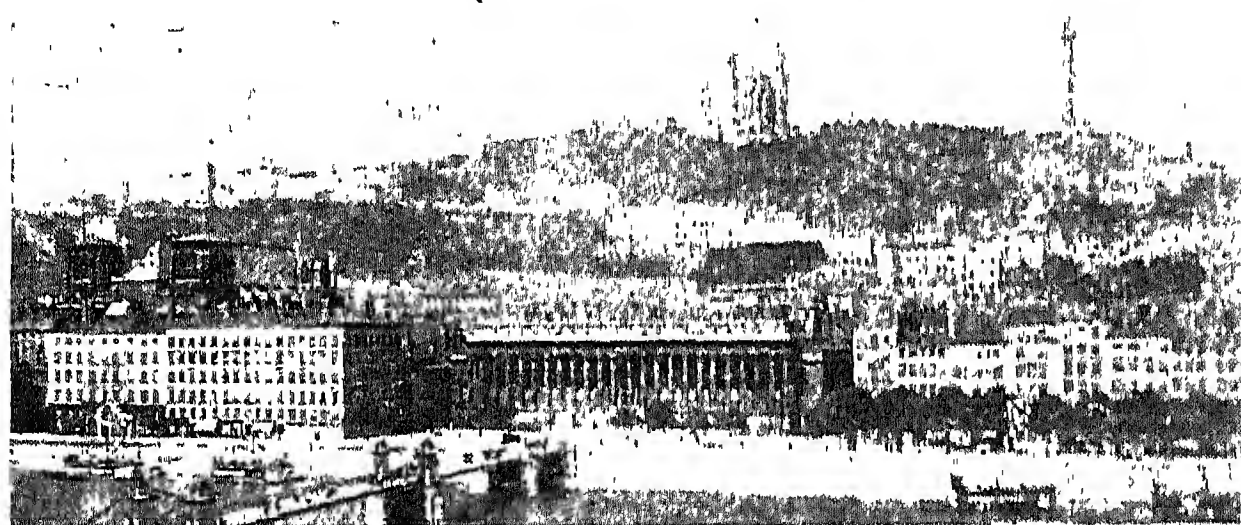
Lyons is the seat of an archbishop and of an ecclesiastical as well as of a state university, both

between the First and Second Great Wars. Lyons is conveniently close to the coalfields of St. Étienne, and electrical power from the French Alps is also available.

In the narrow, old streets in the heart of the city, many medieval buildings survive. Near the Manécanterie, the school of the choir singers (10th cent.), the cathedral of St. Jean (12th to 15th cents.), with fine glass paintings, an astronomical clock, and a valuable treasure, stands out. St. Martin d'Ainay, a 6th cent. basilica, with additions of the 10th to 13th, and the Hôtel Dieu, a hospital founded

tions are famous. Its old established wealth and patrician society have produced an art, musical, theatre, and sports life second only to that of Paris. Much of its 20th cent. development was due to Édouard Herriot (*q.v.*), who, becoming mayor in 1905, gave his city an exemplary administration.

The history of Lyons has been chequered, often tragic. As Lugdunum, it was the capital of the Segunavian Celta, became a Roman colony in 43 B.C., later capital of Gallia Lugdunensis, was the birth place of the emperors Claudius, Marcus Aurelius, and Caracalla; was burnt down by Septimius Severus in 197 A.D., after being Christianised by Saints Pothinus and Irenaeus; was made a bishopric, then, from the 6th cent., an archbishopric; fell first to the Burgundians, then to the Franks, forming the Lyonnais county which was, 1083, embodied in the German empire. When it asked for French protection, 1271, Philippe le Beau granted it urban rights. The 13th

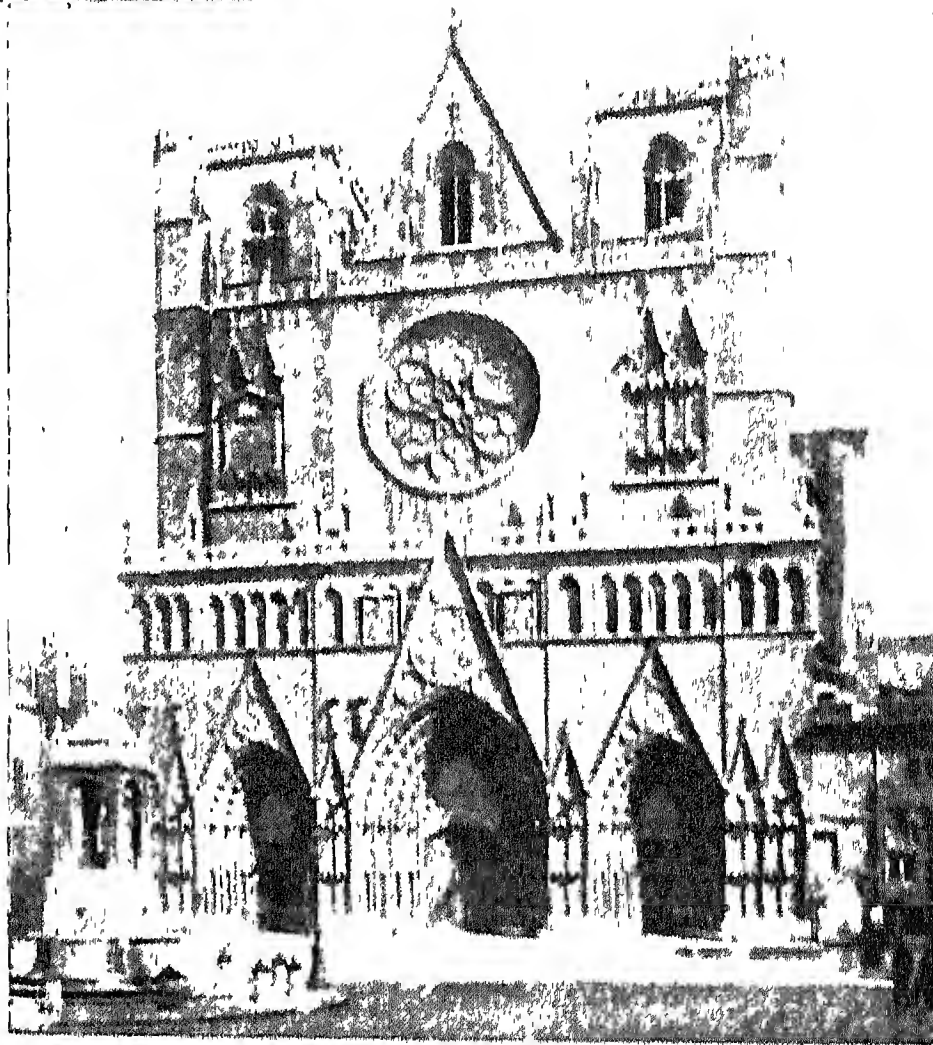


of four faculties, and each with 3,000–4,000 students. Lyons has also a technical university, the école centrale Lyonnaise, and special colleges, etc., for colonial, agricultural, architectural, art, veterinary, and other studies. Among its six public libraries, the local one holds 450,000 vols., more than 1,000 incunabulae, and 5,000 MSS., among them the famous Codex Lugdunensis, illuminated French, Latin, and Persian MSS., and 25,000 engravings; among its museums, that of the history of textiles is unique: it holds 400,000 samples and the most complete collection of lace in the world. Other collections deal with zoology, botany, geography, painting, glyptics, numismatics, antiquities, colonies, industries (esp. silk), etc.

Lyons is generally counted the second industrial centre of France, noted chiefly for its silk manufacture. Introduced from Italy in the early 15th cent., silk has remained the staple commodity of Lyons, the trade being revolutionised by the loom invented by J. M. Jacquard (1752–1834). Such allied trades as hat-making, lace, etc., and nearly all other French industries are represented in Lyons and its suburbs. Furthermore, the city is an important financial centre, headquarters of the Crédit Lyonnais and other banks. The Lyons commercial fair, held twice yearly, was founded in 1916 as a challenge to the supremacy of that of Leipzig, and made rapid progress

in the 6th cent. by King Childebert, St. Bonaventure (14th to 15th), and St. Nizier (15th cent.) represent the Middle Ages; a town hall of 1646–55, with a 130-ft. belfry, and the arts palace, formerly a convent, of 1667, represent the Renaissance. The dominating pile, however, is Notre Dame de Fourvière (1872–84), a Romanesque basilica, on the 1,000-ft. Fourvière hill, with four Byzantine towers. From there—one of France's most famous centres of pilgrimage—and from the nearby "tour métallique," a tower in steel framework, there is a beautiful view over Lyons and its surroundings.

A number of impressive squares—place Bellecour, between the two rivers, place des Terreaux, with public buildings—and open spaces like the parc de la Tête d'Or, together with the green hills, the rivers, and their 30 bridges, the zoological and botanical gardens, and two magnificent Roman theatres contribute to make Lyons an attractive city. Its culinary attrac-



Lyons, France. Façade of the cathedral of St. Jean. Top, left, view from left bank of Saône, showing colonnade of the law courts and church of Notre Dame de Fourvière, on the hill

and 14th papal concilia were held there, 1245 and 1274; after being enriched by the immigration of Italian silk weavers, it suffered heavily in the Huguenot wars.

During the French Revolution Lyons revolted against the regime of terror, was stormed in 1793, partly destroyed, and 6,000 of its citizens were executed. Labour conflicts, etc., led to other severe military reprisals in 1831, 1834, 1840, 1849, and 1871. During 1814 and 1815 it was occupied by

Austrian forces. In Nov., 1930, a landslide wrought havoc in the sector built on the Fourvière hill.

During the Second Great War, Lyons was taken by the Germans June 20, 1940, but under the Franco-German armistice was in unoccupied France, under the jurisdiction of the Vichy govt. On September 22 the municipal council was suspended for the duration of the war, being replaced by a govt. commissioner. Its factories and rly. communications were bombed by the Allied air forces in the

spring and summer of 1944, and on Sept. 3, 1944, it was liberated by the U.S. 7th army, the Germans having withdrawn after destroying all the bridges (including the 12th-century Guillotière bridge over the Rhône) except two. The dome of the Hôtel Dieu had been destroyed by fire, but the city was otherwise little damaged. Pop. (1954) 471,270.

Lyons, COUNCIL OF. Name given to two ecclesiastical assemblies at Lyons. At the first, held under Innocent IV, June 28-July 17, 1245, the emperor Frederick II was deposed. At the second, held under Gregory X, May 7-June 17, 1274, the temporary union of the Greek and Latin Churches was effected. In church history the councils of Lyons rank as the 13th and 14th oecumenical or general councils.

Lyons, RICHARD BICKERTON PEMELL LYONS, 1ST EARL (1817-87). British diplomatist. Son of



1st Earl Lyons, British statesman

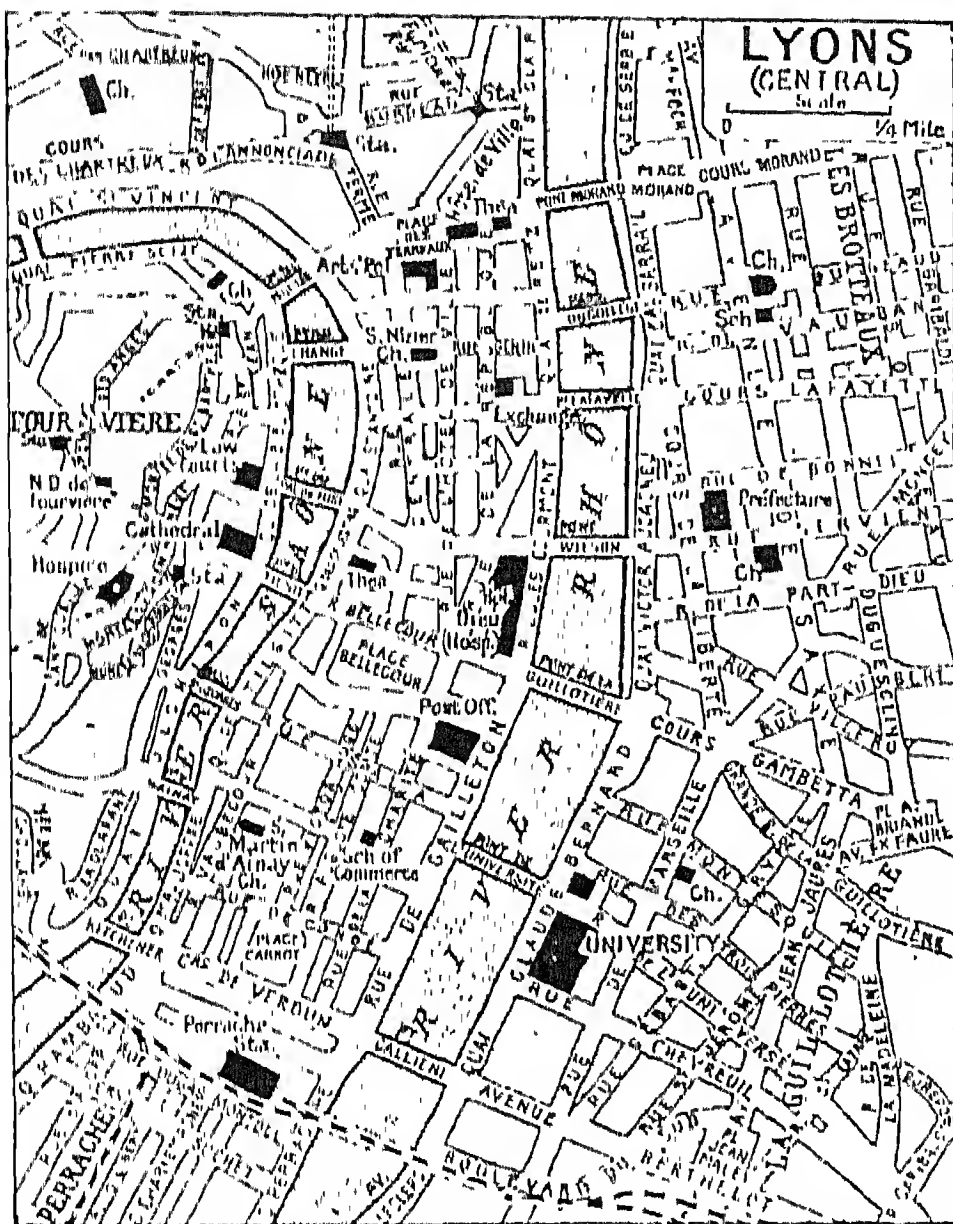
Edmund, Lord Lyons, he was born at Lymington, April 26, 1817, and was educated at Winchester and Christ Church, Oxford. In 1839 he entered the diplomatic service, passed some years at Dresden, Florence, and Rome, and in 1858 was appointed ambassador to

Washington. His attitude during the Civil War was firm, and he carried through with tact the negotiations regarding the Confederate envoys, Mason and Slidell. In 1865 he was transferred to Constantinople, and two years later to Paris. Accompanying the provisional government to Tours, he represented Great Britain while the Third Republic was being established. He resigned his post in Nov., 1887, and died Dec. 5. He had inherited a barony in 1858 and been made an earl in 1887, but both titles became extinct on his death.

Lyons, EDMUND LYONS, 1ST BARON (1790-1858). British sailor. Born at Burton, Hants, Nov. 29, 1790, he went to sea in 1803, and distinguished himself in engagements off the Dutch Spice Islands, 1810. The following year he seized Marrack, a feat carried out in excess of his orders, but ill-health forced his return to England in 1812, and two years later he retired. In 1828 he was sent to the Mediterranean, played a hand in the confused game of Greek politics, and in 1835 was appointed minister plenipotentiary at Athens.



1st Baron Lyons, British sailor



Lyons, France. Plan of the great commercial city; the bridges, destroyed in 1944, were rebuilt

Transferred to Berne, 1849, and in 1851 to Stockholm, he was recalled in 1853 and sent to the Mediterranean as second in command of the fleet dispatched on the outbreak of the Crimean War. In 1855 he succeeded Dundas in command of the fleet. Retiring in 1858, he died Nov. 24. For two years he had been a baron.

Lyons, SIR HENRY (1864-1944). British scientist. Born in London, Oct. 11, 1864, he was the son of a general who had governed Bermuda. Commissioned in the Royal Engineers, he was interested in geology, serving as director of the survey department of the Egyptian government from 1898 to 1909. Lyons's scientific work was important economically as well as geographically, and he became F.R.S., 1900. During the First Great War meteorology claimed his attention; he organized services for the British armies in France, and in 1918 was director of the Meteorological Office. After the war he assumed the directorate of the Science Museum, London, a post he held until 1933. He was knighted in 1926. He became first secretary of the international union of geodesy and geophysics, and later secretary of the international council of scientific unions. He was also president of the Royal Meteorological Society. Lyons died Aug. 10, 1944.

Lyons, SIR JOSEPH (c. 1847-1917). British business man. A Londoner, he was educated at a Jewish school. He studied art and had some success with water-colour drawings, but by chance his attention was turned to the subject of catering for the masses. With two friends, Isidore and Montagu Gluckstein, he began to cater for exhibitions, etc., and in 1894 the firm of J. Lyons & Co. opened its first tearoom. Others followed, both in London and in the provinces, and before Sir Joseph died his was the largest business of its kind in the U.K. Knighted in 1911, he was chiefly interested outside his business in the Territorial Force. He died June 22, 1917.

Lyons, JOSEPH ALOYSIUS (1879-1939). Australian statesman. Born at Stanley, Tasmania, Sept. 15, 1879, he became a school teacher, and was elected to the island house of representatives in 1909. He held government posts from 1914 and was premier of Tasmania, 1923-28. He became postmaster-general and minister for public works in the Commonwealth government, 1929-31. Then he founded the



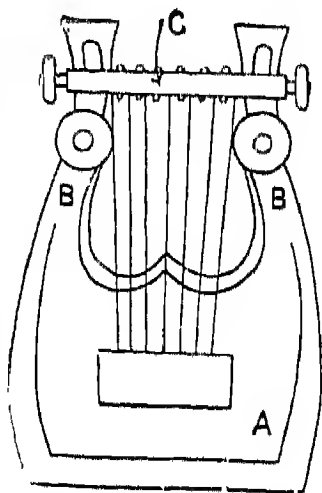
Joseph A. Lyons,
Australian statesman

United Australia party, and after leading the opposition, became prime minister in 1932 and was made a privy councillor. He represented Australia at George V's silver jubilee celebrations, at the Imperial trade conference in 1935, and at the coronation of King George VI in 1937. That year he began his third successive term as premier of the Commonwealth, an office he held until his death on April 7, 1939.

Lyon's Inn. Old London inn of chancery. It stood between Wych St. and Holywell St., Strand, existed in the time of Henry VIII or earlier, and was attached to the Inner Temple from 1581 to 1863, when it was pulled down, and the Globe and Opéra Comique theatres were built upon its site. The last vestige of the inn, which once had Sir Edward Coke as reader, disappeared with the two playhouses in 1902 during the construction of Aldwych (*q.v.*). Its history is associated with the murder of William Weare, a resident, by Thurtell and Hunt, in 1823, the theme of a mock Catnach ballad by Theodore Hook and a novel by Thomas Burke. See Holywell Street; Inns of Court.

Lyra. One of the constellations. Though a small group of stars, it contains the great and brilliant Vega, one of the most conspicuous stars of summer skies. Vega forms one of the points of an equilateral triangle, at the other angles of which are epsilon and zeta Lyrae. Zeta, beta, gamma, and delta of the constellation form a little rhomboid. These stars are all visual doubles. Lyra is close to the borders of the Milky Way, near Cygnus. The constellation is also remarkable for the ring nebula, Messier 57.

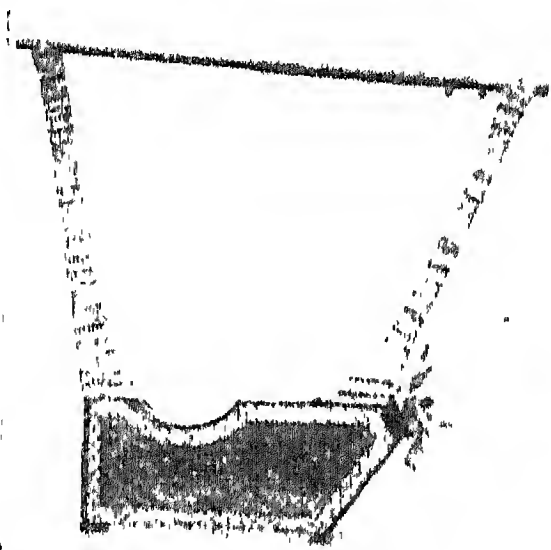
Lyre. Musical stringed instrument, used in ancient and medieval times. It consisted of a hollow box or resonator with two projecting arms support-



Lyre. Diagram explaining construction of Greek lyre. A. Resonator. BB. Horns or uprights. C. Cross-bar

ing a cross-bar from which about seven strings were stretched. The strings were plucked by the fingers or with a plectrum. The lyre was akin to the harp, but with fewer strings, and was a relation also of the lute, but without finger-board. The diagram will make these distinctions clear.

The shape of the lyre, which has differed in detail from time to time



Lyre. Restoration of lyre discovered at Ur (about 3,500 B.C.). It is decorated with mosaic and a bull's head in gold

Courtesy of Joint Expedition to Ur

without departing from its general principles, has been said to have been derived originally from the top of the skull and the horns of a bull or goat. See Greek Art.

Lyre Bird. Genus of birds (*Menura*) found in the forests of Australia. They gain their name from the extraordinary development of the tail in the males; the two outer feathers being curved in the form of the frame of a lyre, while the intermediate ones are slender and provided with few barbs, thus suggesting the strings. The several species vary in the colour of their plumage; all spend most of their time on the ground, in the denser parts of the bush, where they feed upon snails, insects, and worms. They seldom fly, but can run fast. See Birds, colour plate.

Lyric (Gr. *lyra*, a lyre). Name given to a poem, or form of poetry, so called since it was originally composed to be sung to, or accompanied on the lyre, as distinguished from forms more suited to declamation or recitation. The term, however, has long been applied to many types of verse which have few or none of the characteristics of song. Poetry sometimes spontaneous, sometimes meditative, often slow in movement and reflective in character, like many English sonnets, is in the absence of more exact terminology, usually described as lyrical. The ode, hymn, song, and some types of elegy and ballad are examples of true lyric, which commonly treats

of personal, patriotic, devotional, or amatory themes, in which the emotional, as distinct from the narrative element, is conspicuous.

In primitive periods, when dance, music, and song were closely associated, poetry was altogether choral, and in the refrain or chorus, still surviving in some modern songs, we have the germ of lyrical, as indeed of all poetry, which, like speech itself, is communal in origin. As individuality and civilization developed, the chorus fell silent, and poetry became more of a personal utterance. Broadly speaking, then, lyrical poetry is intimate, personal, subjective, descriptive of the joys, sorrows, hopes, and aspirations of the individual, and by the lyrical cry is meant the cry of the heart, of the more poignant emotions. In the more formal and elaborate modes, however, like that of Alexander's Feast or Wordsworth's Ode on Intimations of Immortality, it frequently develops themes in a rhetorical or philosophical spirit, while in some poems, like the



Lyre Bird. Male specimen of the Australian bird

Robin Hood Ballads or Scott's Rosabelle (lay of the Last Minstrel), the subject is treated in the objective narrative manner.

In lyrics we have the choice and sublimated essence of poetry, the pure elixir, which in other poetic forms, like epic or drama, as in some degree mixed with foreign matter, rich, it may be, in interest, but of a different order, in which prosaic elements are still present. In this rapturous singing region those poets rank highest who, like Shelley, seem at times almost to have made good their escape from the world of common life.

Lyrical poetry, it may be said, most nearly approaches music itself, interpreting emotions hardly to be conveyed in ordinary speech. It offers little beyond itself, its own inherent interest, "whose peculiarity lies in the isolation of the pleasure it gives from life and social conditions." On the other hand, poetry which illuminates and interprets human experience, like that of Wordsworth, in whom the singing note is less clearly heard, but in whom there is a "noble and profound application of ideas to life," even if less purely lyrical, cannot be regarded as less, and by some minds will always be regarded as more, precious. The truth is, poetry has outgrown the early categories, and it is the especial glory of English literature, as displayed in the astonishing variety of its themes, that it has captured for lyrical poetry new territory and enlarged the kingdom of the imagination.

W. McNeill Dixon

Lyric Theatre. London playhouse in Shaftesbury Avenue, W.1. It was opened Dec. 17, 1888, with a production of the comic opera *Dorothy*, and became the home of well-known musical comedies, e.g. *La Cigale*, 1890; *The Chocolate Soldier*, 1910; *The Girl in the Taxi*, 1912; *Lilac Time*, 1922. Among notable dramas presented here were *Autumn Crocus*, 1931; *Dangerous Corner*, 1932; *Tovarich*, 1935; *Amphitryon '38*, 1938; *The Winslow Boy*, 1946. The theatre seats 1,475.

Lyric Theatre, HAMMERSMITH. Playhouse opened Nov. 17, 1890. Though a suburban theatre, it became nationally famous under the direction, 1918-32, of Sir Nigel Playfair (*q.v.*), whose revival of *The Beggar's Opera* in 1920 ran here for 1,463 performances. Other successes were A. P. Herbert's *Riverside Nights*, 1926, and *Tantivy Towers*, 1931. The Company of Four, a non-profit-making organization associated with the Arts Council, assumed control in 1945; plays by Sartre, Cocteau, and other contemporary Continental writers, as well as English classics, were produced under its aegis. The theatre seats 800.

Lys. A river of France and Belgium. It rises in the Pas-de-Calais, between Boulogne and Lille, and flows mainly N.E. Between Aire and Armentières it crosses a flat, low plain, naturally a marsh, and finally joins the Scheldt at Ghent. The middle section of the valley is one of the most densely peopled areas in the world. There

are steel works at Isebergues in the French section, while the towns lower down are noted centres of the linen industry. The Ypres canal joins the Yser with the Lys at Comines. Most of its length of 120 m. is navigable.

The river was prominent throughout the First Great War, from the first battle of Ypres in 1914 to Oct. 16, 1918, when in the final battles the British reached the left bank, forcing a passage at Beveren a few days later. During the Second Great War there was fighting on the Lys in 1940. A lightning German advance had by May 21 made it necessary for the British and Belgians to fall back from their positions along the Scheldt; the Belgians held a sector from Ternuzen to Ghent and thence along the Lys to Halluin, while the British on their right covered Lille and Douai. On May 24 the Germans breached the Belgian line on a front of 13 m. in the Courtrai area. The British, their left threatened and their hopes of closing the gap between themselves and the main French armies rapidly vanishing, retired to positions on the Lys between Merville and Comines, May 27-28, just as the Belgians asked for an armistice. The Germans made no attempt to stand on the Lys during the rapid advance of the British 2nd army from the Seine to Antwerp, Aug. 30-Sept. 4, 1944.

Lysander (d. 395 B.C.). Spartan general and statesman. He rose to fame during the latter period of the Peloponnesian War (*q.v.*). As commander of the Spartan fleet, off the coast of Asia Minor, he ingratiated himself by skilful diplomacy with Cyrus the Younger, and received from him subsidies for the Spartans, which proved a factor in their triumph. In 405 B.C. his fleet defeated that of the Athenians at the battle of Aegospotami, which virtually brought the Peloponnesian War to an end. In the following year he took Athens, destroyed the famous Long Walls, and established the rule of the thirty tyrants. In 396 he accompanied the Spartan king, Agesilaus, against the Persians in Asia Minor, and was killed in 395 at the battle of Halartus in the Boeotian War.

Lysander. Character in Shakespeare's comedy, *A Midsummer Night's Dream*. In love with Hermia, he is forbidden to marry her by her father, who has selected Demetrius as her husband. Lysander knows that "the course of true love never did run smooth," but all ends happily.

Lysenko, TROFIM DENISOVICH (b. 1898). Russian biologist. Born Sept. 29, 1898, at Karlovka, Ukraine, he became director of the institute of genetics of the academy of sciences of the U.S.S.R. In August, 1948, he read a report to the Lenin academy of agricultural science, setting forth certain theories of genetics, elaborated from those of the plant-breeder I. V. Michurin, as ensuring the development of a progressive, socialist theory of biology, and denouncing as idealistic, bourgeois, reactionary, and anti-nationalist 12 leading Russian scientists who opposed these views. They were dismissed from their posts, the Lysenko doctrine, which admits the inheritance of acquired characteristics, and the existence of negative hybrids and hybrids with more than two parents, becoming mandatory for all scientists in Russia and satellite countries. He lost his power after Stalin died, and his official position in 1956.

Lysias (c. 459-c. 380 B.C.). Greek orator, born at Athens, of Syracusan descent. The thirty tyrants took his property, and slew his brother Polemarchus, 404. When the thirty were overthrown he impeached one of them, Erastosthenes, in a brilliant speech. There are 34 extant speeches of Lysias, who was the first to introduce into oratory the plain straightforward language of everyday life.

Lysimachus (c. 360-281 B.C.). Macedonian general and king of Thrace. On the death of his master, Alexander the Great, in 323, he was made governor of Thrace and the country to the N., and assumed the title of king in 306. In the fighting that broke out among the successors of Alexander he was able, as a result of the successful battle of Ipsus in 301, to add to his dominions, obtaining control of a slice of Asia Minor. By 287 he was ruler of all the old kingdom of Macedonia, in addition to his Asiatic territories. He later fell out with his old ally, Seleucus, king of Syria, whom he attacked, and who gained a victory at Corus in which Lysimachus was killed.

Lysippus. Greek sculptor of the 4th century B.C. He belonged to the school of Argos of Sicyon. No authentic example remains of his 1,500 statues, mostly bronze, but there are many reproductions. He made a series of statues of Alexander the Great, who refused to employ any other sculptor.

Lysistrata. Comedy by Aristophanes. It appeared about 411 B.C., shortly before Poisander

arrived in Athens from Samos to put in practice an oligarchic policy, and represents a women's conspiracy to bring about peace. The war between Athens and Sparta having been renewed, Lysistrata, "disbander of armies," persuades the Athenian matrons to desert their husbands and refuse to return home until peace is again established. Confronted with this strike of wives, the men are rendered powerless: the women occupy the citadel, and bring the citizens to surrender.

Lyskamm OR SILBERBAST. A mountain of the Monte Rosa Group on the Italo-Swiss border. The E. peak has an alt. of 14,860 ft., and is ascended via the Lysjoch (14,030 ft.). The ascent is dangerous. The W. summit, 14,688 ft. in alt., is ascended from the Quintino Sella Hut (alt. 11,815 ft.). See Alps.

Lysol. Widely used disinfectant containing 50 p.c. by volume of cresol dissolved in water by the addition of soap made from a fixed vegetable oil and caustic soda or potash. In some places outside the U.K. Lysol is a proprietary term.

Lysons, DANIEL (1762-1834). British topographer. Born April 28, 1762, and educated at Bath grammar school and S. Mary Hall, Oxford, he became curate of Mortlake, then of Putney, and later succeeded to the living of Rodmarton, Glos, dying at Hempstead Court, Jan. 3, 1834. He is best known as the author of a valuable work on The Environs of London, 1792-96, of which a second edition appeared in 1811.

Lysons, SAMUEL (1763-1819). British antiquary. Second son of the rector of Rodmarton, Glos, he was born May 17, 1763, educated at Bath grammar school, and called to the bar in 1798. In 1803 he became keeper of the records at the Tower of London. An artist, he exhibited at the Academy, contributed etchings to his brother Daniel's Environs of London, and worked for many years on his Reliquiae Britannico-Romanae, containing Figures of Roman Antiquities Discovered in England, 1801-17. He died June 29, 1819.

Lystra. City of Lycaonia in Asia Minor, the modern Khatyn Serai. It was several times visited by S. Paul, and it was here that the people wished to offer sacrifice to him and S. Barnabas, supposing them to be incarnations of Mercury and Jupiter (Acts 14).

Lyte, HENRY FRANCIS (1793-1847). British hymn writer. Born at Ednam, Roxburghshire, June 1,

1793, he was educated at Portora, Ireland, and Trinity College, Dublin. Ordained in 1815, he was incumbent

of All Saints, Lower Brixham, 1823-44. Popular among the fisher folk, he wrote songs for sailors, and founded a large Sunday school. Despite Poems Chiefly Religious, 1833, and

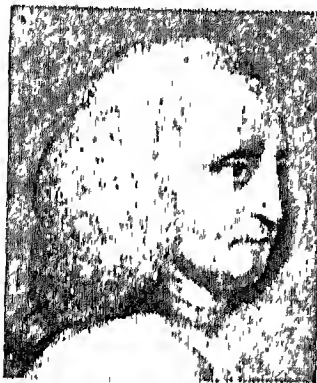
The Spirit of the Psalms, 1834, he is chiefly remembered for the hymn, Abide with Me. This was written in late summer, 1847: Lyte died Nov. 20 at Nice. Praise my soul, the King of Heaven is also his.

Lytham St. Annes. Bor. and resort of Lancs, England. At the mouth of the Ribble, 13 m. W. of Preston, it is reached by road, rly., or steamer. In 1922 the urban districts of Lytham and St. Annes were incorporated by charter as a borough, of which the N. touches Blackpool. There are promenades and a pier, good bathing and golf, remedial baths, gardens, and facilities for riding and yachting. Pop. (1951) 30,343.

Lythraceae. Family of herbs and shrubs. Most of them are native to the tropics, but a well-known European representative is the purple loosestrife (*Lythrum salicaria*). The leaves are opposite or in whorls. The family includes such plants as henna (*Lawsonia inermis*) and pomegranate (*Punica granatum*).

Lyttelton. Chief port of the district of Canterbury, New Zealand. It has a fine natural harbour, 10 m. by 2 m., encircled by steep hills tunnelled to give access to Christchurch, 7 m. to N.W. It has a large graving dock and exports wool and grain. Pop. (1951) 3,686.

Lyttelton, GEORGE LYTTLETON, 1ST BARON (1709-73). British politician. He was born Jan. 17, 1709,



1st Baron Lyttelton, British politician

at Hagley, his mother being one of the Temples of Stowe. Educated at Eton and Christ Church, Oxford, he entered the house of commons in 1735 for Okehampton, being already one of the intimates of Frederick, prince of Wales. In 1755 he became chancellor of the

exchequer, but in 1756 he retired and was made a peer. An active politician until his death, Aug. 22, 1773, Lyttelton was regarded as an orator, and was a voluminous writer, but his influential position was due really to family connexions. His most ambitious works are Life of Henry II; and Observations on the Conversion and Apostleship of S. Paul, 1747. His successor was his son Thomas.

Lyttelton, THOMAS LYTTLETON, 2ND BARON (1744-79). British politician. Born at Hagley, Jan. 30, 1744, he was the eldest son of the 1st lord. Educated at Eton and Christ Church, Oxford, he entered parliament for Bewdley in 1768, but was unseated in 1769. In 1773 he succeeded to the peerage, and was a constant speaker in the house of lords. Known as the Bad Lord Lyttelton, he pursued a vicious life notorious even in that age, but was regarded as a man of ability. On Nov. 24, 1779, being apparently in good health, he dreamed he was warned by a woman that he had only three days to live. On the 27th, at Hill Place, Epsom, he died just before midnight. It has been stated that he suffered from heart disease and took drugs. On his death the barony became extinct. It was revived 1794 in favour of an uncle, William Henry Lyttelton (1724-1808). A Life of Thomas, 2nd baron, by R. Blunt, came out in 1936.

Lyttelton, GEORGE WILLIAM LYTTLETON, 3RD BARON (1817-76). British publicist. Eldest son of the 3rd Lord Lyttelton, of the second creation, he was born in London, March 31, 1817. Educated at Eton and Trinity College, Cambridge, he was senior classic in 1838. In 1837 he had succeeded to the peerage, and in 1846 was made under secretary for the colonies, but his main interests were outside politics. He joined in founding the Anglican settlement of Canterbury, N.Z., a fact commemorated by the name of the borough of Lyttelton. He was an active supporter of the



2nd Baron Lyttelton, British politician



4th Baron Lyttelton, British publicist

Lyttelton, GEORGE WILLIAM LYTTLETON, 4TH BARON (1817-76). British publicist. Eldest son of the 3rd Lord Lyttelton, of the second creation, he was born in London, March 31, 1817. Educated at Eton and Trinity College, Cambridge, he was senior classic in 1838. In 1837 he had succeeded to the peerage, and in 1846 was made under secretary for the colonies, but his main interests were outside politics. He joined in founding the Anglican settlement of Canterbury, N.Z., a fact commemorated by the name of the borough of Lyttelton. He was an active supporter of the

Church of England, and during 1869-74 was chief commissioner of endowed schools. On April 19, 1876, in a fit of melancholy he threw himself from a staircase, dying soon afterwards. Lyttelton married in 1839 the younger daughter of Sir Stephen Glynne (whose elder daughter on the same day married Gladstone). Of their eight sons, one became Viscount Cobham, and three others are noticed below.

Lyttelton, ALFRED (1857-1913). British politician and athlete. Born Feb. 7, 1857, the youngest



Alfred Lyttelton, British politician

son of the 4th Lord Lyttelton, he was educated at Eton and Trinity College, Cambridge, and was called to the bar at the Inner Temple. After taking silk he became successively recorder of Hereford and of Oxford, and chancellor of the diocese of Rochester. In 1895 he was returned to parliament as Unionist M.P. for Warwick and Leamington. He had acted as chairman of the Transvaal concessions commission in South Africa, and on his return in 1903 he was chosen Colonial secretary. It was his lot to face the storm that arose about the employment of Chinese in the Transvaal. In 1906 he left office and lost his seat at Warwick, but was returned the same year for St. George's, Hanover Square, a seat he kept until his death, July 5, 1913.

If only of average ability as a politician, Lyttelton was a supreme athlete. At almost every ball game he was a master. At Eton and Cambridge he captained the cricket eleven, and he kept wicket for England against Australia. He played association football for England; rackets and football for Cambridge, and 1882-95 was amateur champion at tennis. He was twice married, first to Laura Tennant, who died in 1886, a year after their marriage; and secondly in 1892 to Edith Balfour, who wrote his *Life*, 1917.

Alfred Lyttelton's eldest son Oliver (b. 1893), educated at Eton and Trinity, Cambridge, served in the Grenadier



Oliver Lyttelton, Viscount Chandos

Guards during the First Great War. A City business man, in 1939 he was made controller of non-ferrous metals in the ministry of Supply, entering parliament in 1940 as Conservative member for Aldershot. President of the board of Trade 1940, in 1941 he was minister of state in the Middle East. Minister of Production 1942-45, he was colonial secretary 1951-54, visiting Kenya in 1952 in connexion with the Mau Mau disturbances. He was created Viscount Chandos in 1954.

Lyttelton, EDWARD (1855-1943). A British schoolmaster. Born in London, July 23, 1855, the seventh son of the 4th Lord Lyttelton, he was educated at Eton and Trinity College, Cambridge. Like his brothers, he was a fine cricketer, and captained the University eleven. He began teaching in 1880 at Wellington College, and in 1882, after taking holy orders, went to Eton. From 1890 he was headmaster of Haileybury until in 1905 he was chosen head of Eton. He resigned in 1916, and during 1918-20 was rector at Sidestrand, Norfolk. He published *Cricket*, 1890; *Character and Religion*, 1912; *Whither?*, 1931. He died Jan. 26, 1942.



Edward Lyttelton, British schoolmaster

Lyttelton, SIR NEVILLE GERALD (1845-1931). British soldier. Born at Hagley, Worcestershire, on Oct. 28, 1845, third son of the 4th Lord Lyttelton, he was educated at Eton and Sandhurst, and was commissioned in the Rifle Brigade in 1865. He served against the Fenians in Canada, 1866; in Egypt, 1882; commanded a brigade in the Nile expedition, 1898, and a division in the S. African War. He was c.-in.-c. in S. Africa, 1902-04, being knighted in 1902. Next he was chief of the general staff, and during 1908-12 was c.-in.-c. in Ireland. He was governor of Chelsea Hospital from 1912. He published reminiscences in 1927, under the title *Eighty Years: Soldiering, Politics, Games*. He died July 6, 1931.

Lytton, EDWARD ROBERT LYTTON, 1ST EARL OF (1831-91). British diplomatist and poet. Born in London, Nov. 8, 1831, son of the 1st Baron Lytton, he was educated at Harrow and Bonn, and began his diplomatic career in 1849 as private secretary to his uncle, Sir Henry

Bulwer, the British minister at Washington. He occupied positions in the embassies at Florence, Paris, The Hague, Vienna, Athens, Lisbon, and Madrid. In 1873 he succeeded his father in the barony; in 1876 he was appointed viceroy of India. On his resignation in 1880 he was created an earl. From 1887 he was again ambassador in Paris, where he died Nov. 24, 1891. Under the pseudonym of Owen Meredith, he published *Clytemnestra and Other Poems*, 1855; *The Wanderer*, a collection of lyrics, 1857; *Lucile*, a tale in verse, 1860; *Glenaveril* or the *Metamorphoses*, a narrative poem, 1885; *King Poppy*, 1892. His poetry is facile and cultured, but lacking in inspiration. He published a biography of his father in two volumes in 1883.



1st Earl of Lytton, British diplomatist

Lytton, VICTOR ALEXANDER GEORGE ROBERT LYTTON, 2ND EARL OF (1876-1947). A British administrator and author. Son of the 1st earl, whom he succeeded in 1891, he was born at Simla, Aug. 9, 1876, and educated at Eton and Trinity College, Cambridge. In 1901 he was assistant to the secretary for Ireland. Civil lord of the Admiralty, 1916, and under-secretary for India, 1920, he was governor of Bengal, 1922-27, during a period of unrest, and viceroy of India, April-Aug., 1925.

From 1927 he played a leading part in the work of the League of Nations Union. In 1932 he was chairman of the commission on Japan's occupation of Manchuria. As a result of the Lytton report, Japan was condemned by the League of Nations for having taken military action, and in 1933 she gave notice to quit the League. The earl's advocacy of internationalism was carried on in the United Nations Association, of which he was chairman at the end of the Second Great War. Lytton did much to promote social clubs, and was interested in town planning and in the arts, being president of the Royal Society of Literature. He published a biography of his grandfather, the 1st Baron Lytton, 1913; *The Web of Life*, 1938; *Pundits and Elephants* (autobiography), 1942, and other books. *Antony: A Record of Youth*, 1935, commemorated his elder son, Viscount Knebworth,

killed flying in 1933. His younger son died in action, 1942. Lord Lytton died Oct. 25, 1947, and was succeeded by his brother Stephen (1879-1951), whose son Noel (b. 1900) became 4th earl.

Lytton, EDWARD GEORGE EARLE **LYTTON BULWER-LYTTON, 1ST BARON (1803-73).** British writer and statesman. Born in London, May 25, 1803, he was the 3rd son



Lytton

From a drawing by D. Laugel

of General Bulwer, of Wood Dalling, Norfolk, his mother being a Lytton of Knebworth, Herts. From private schools and tutors he proceeded to Cambridge, Trinity College and then Trinity Hall. A precocious child, he began to write verse at seven.

Of his many novels, which enjoyed a tremendous contemporary vogue, and some of which, like others among his works, were issued anonymously, the more notable are *Pelham*, 1828; *Paul Clifford*, 1830; *Eugene Aram*, 1832; *The Last Days of Pompeii*, 1834; *Rienzi*, 1835; *The Last of the Barons*, 1843; *Harold*, 1848; *The Caxtons*, 1849; *My Novel*, 1853; *What Will He Do With it?* 1858; *The Parisians*, 1873; *Kenelm Chillingly*, the same year and to some extent autobiographical. He wrote short stories, *The Haunters and The Haunted*, 1857; *A Strange Story*, 1862; also a prophecy of the future, *The Coming Race*, 1871. Of his plays, *The Lady of Lyons*, 1838; *Richelieu*, 1839; and *Money*, 1840, have been occasionally revived. His other works include *England and the English*, 1833; *Athens, Its Rise and Fall*, 1837.

At first a Liberal in politics, Bulwer was M.P. for St. Ives, Hunts, 1831, and Lincoln, 1832-41. He sat for Herts as a Conservative, 1852-66, and was colonial secretary, 1858-59, displaying much administrative insight and ability. Made a baronet in 1838, when he inherited Knebworth and adopted the name of Bulwer-Lytton, he was created a baron in 1866, a G.C.M.G. in 1870, and was twice lord rector of Glasgow university. In 1827 he married Rosina Doyle Wheeler (1802-82), by whom he had one son, Edward Robert (1831-91), the 1st earl of Lytton; and one daughter, Emma (1828-48). The marriage was opposed by his mother; husband and wife separated in 1836, and the story of their unhappiness is one of the most poignant in English literary history. He died at Torquay, Jan. 18, 1873, and was buried in Westminster Abbey.

Lytton revived the novel, and with Carlyle and Coleridge helped to introduce German scholarship to England. Despite the variety and volume of his work, he was a writer whose industry was as remarkable as his versatility. He lacked taste and was deficient in characterisation. He over-sentimentalised and over-moralised; his melancholy drifted into the tedious or approached the maudlin. But he knew how to fashion a plot, was a sincere student in letters and in the region of the occult, and in spite of all his defects there is much in his novels, speeches, essays, and correspondence that is of permanent interest and value. The first to give encouragement to Browning in print, he worked in and out of parliament for his fellow authors.

W. F. Aitken
Bibliography. Works, 37 vols., 1873-75; Lives, T. Cooper, 1873; 2nd earl of Lytton, 1913; Letters to his Wife, 1884; A Panorama, M. Sadleir, 1931.

Lytton, SIR HENRY ALFRED (1867-1936). British actor. Born in London, Jan. 3, 1867, he was educated at St. Mark's College, Chelsea, and later joined the chorus of the D'Oyly Carte touring company, first appearing in *Princess Ida* at Glasgow. Graduating to the principal company, he found a congenial niche for himself in interpreting various characters in the Gilbert and



Sir Henry Lytton,
British actor

Sullivan repertory. He played in all as many as 30 of these characters, but eventually was chiefly identified with the comedy parts originally played by Grossmith, e.g. Ko Ko, in the *Mikado*; Jack Point in the *Yeomen of the Guard*. For 25 years from 1909 he appeared exclusively in these operas, reaching wide popularity. His impish sense of fun was admirably suited to their peculiar form. After his retirement from the D'Oyly Carte company, he appeared in pantomime at Birmingham. Knighted in 1930, he retired in 1934, the jubilee year of his first appearance. He published *Secrets of a Savoyard*, 1922; *A Wandering Minstrel*, 1933. Lytton died Aug. 15, 1936.

Lytton, ROSINA DOYLE BULWER-LYTTON, LADY (1802-82). Wife of the first Baron Lytton (q.v.). Born Nov. 2, 1802, at Ballywire, co. Limerick, daughter of F. M. Wheeler, she passed an early home life almost without restraint. When 10 she accompanied her mother on a long visit to Sir John Doyle, governor of Guernsey, with whom, during her mother's absence in France, she afterwards lived in London, becoming associ-



Rosina, Lady Lytton
From a drawing by
A. P. Chalon

ated with Lady Caroline Lamb and others of the Bohemian literary set. Her engagement to Bulwer was broken off three times before the marriage took place in Aug., 1827. Before the final separ-

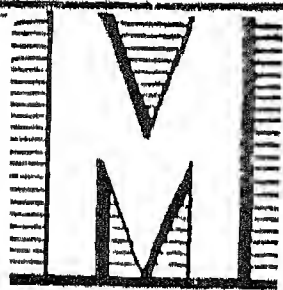
ation she lived with her husband at Woodcot House, Oxon, at 36, Hertford Street, London, and at Berrywood Priory, Acton. Later she passed a wandering life at Bath, Paris, Florence, Geneva, Langollen, and Taunton. In 1875 she took a small house at Upper Sydenham, where she died March 12, 1882. She was buried in the churchyard of St. John the Evangelist, Shirley, Surrey. She was the author of 13 novels, some poems, and a book of essays, *Shells from the Sands of Time*, 1876. Novels include *Cheveley*, or *the Man of Honour*, 1839; *Budget of the Bubble Family*, 1840; *Bianca Capello*, 1842; *Behind the Scenes*, 1854; *Very Successful*, 1856; *The World and His Wife*, 1858; *Manleverer's Divorce*, 1871.



Lyublyana. The fourth city of Yugoslavia is in this Encyclopedia spell Ljubljana.

M, THE 13th letter of the English alphabet, held the same position in the North-Semitic and Etruscan alphabets, but was the 12th in the Greek and Latin alphabets, and the 14th in early Slavonic alphabets. Out of its earliest North-Semitic forms

there evolved the Greek forms

; the last symbol, through the Etruscans, was taken over by the Romans and has been handed down to the present-day English alphabet as the capital M.



In Roman writing of the 1st century A.D. (e.g. in wall inscriptions and on the waxed tablets of Pompeii), the vertical, slightly oblique, four-stroke symbol  was preferred. In the Roman uncial script, the *m* has the characteristic rounded shape  which is a main feature of the uncial hand. Some time later, the cursive minuscule assumed a form similar to the present-day small m or *m*.

Medieval copyists often omitted the letter *m*, representing it by a stroke over the preceding letter; e.g. *exemplum* would be written *exēplū*; the practice survived well into the 17th century.

M Thirteenth letter of the English and Latin alphabets. One of the labial consonants, its articulation is that of *b*, except that the breath passes through the nose, whence it is often called a labio-nasal. M always has the same sound, as in *mat*, *stem*. In words beginning with *mn*, derived from the Greek, as *mneumonics*, it is mute, though note *colum-nar* and *hym-nal*. It has considerable affinity with *n* (cf. *emmet* and *ant*), and with *b*, the latter being mute when combined with it finally (*numb*, *thumb*). As a symbol in Roman notation M = 1,000, M = 1,000,000. See Abbreviations; Alphabet; Phonetics.

Maars. In geology, hollows or depressions in the land surface formed by isolated volcanic explosions. The depressions are described as embryonic or abortive volcanoes, and, having in most cases become filled with water, they form roughly circular lakes. The name is derived from occurrences in the Eifel district of Germany, where they are known as *maare*, or crater-lakes.

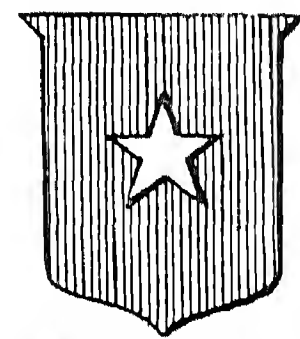
Maartens, MAARTEN. Pen-name used by the Dutch novelist, Joost Marius Willem van der Poorten Schwartz (1858-1915). Born at Amsterdam, Aug. 15, 1858, he was educated in England and at Bonn

university, and for a time was a lecturer on law at Utrecht. He began, in 1889, the publication of a series of novels giving a realistic picture of life in contemporary Holland. They were published simultaneously in Dutch and English. His principal works are *The Sin of Joost Avelingh*, 1890; *God's Pool*, 1892; *The Greater Glory*, 1894; *Some Women I Have Known*, 1901; *My Poor Relations*, 1903; *Dorothea*, 1904; *Brothers All*, 1909; *Harmen Pöls, Peasant*, 1910. He died at Doorn, Aug. 5, 1915.

Maas (Fr. Meuse). Dutch name given to that part of the river called Meuse in France and Belgium which flows through the Netherlands from a little S. of Maastricht to its mouth. It played an important part in the operations of the Second Great War. German parachutists seized the Moerdijk bridges (*q.v.*) when the Germans invaded the Netherlands on May 10, 1940, and so cut communications between the N. and S. provs. In 1944 the Germans stood along the right bank of the river from Blerik to its mouth, in Nov., the upper reaches being freed by the U.S. 9th army at the beginning of March, 1945; but the mouth only with the German surrender in May. See Meuse.

Maassluis. Town and port of the Netherlands, in the prov. of S. Holland. It lies 10 m. by rly. W. of Rotterdam, on the N. bank of the Nieuwe Waterweg, which joins Rotterdam with the North Sea. It is a centre of the herring fisheries.

Maastricht. A town of the Netherlands, capital of the prov. of Limburg. It lies on the left bank of the Maas, close to the Dutch-Belgian frontier, 19 m. by rly. S.S.W. of Hasselt. The rly. station is in the suburb of Wyk, on the right bank of the river.

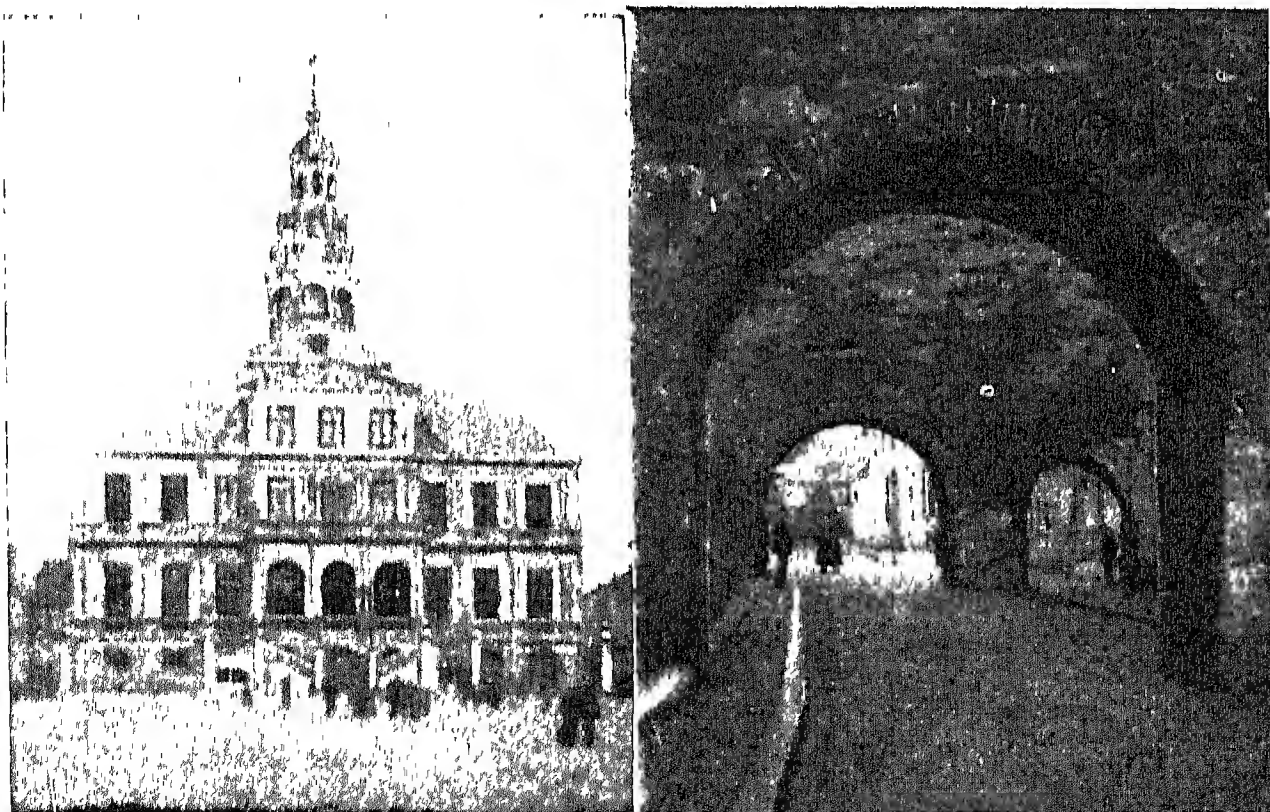


Maastricht arms

There is a large volume of river-wise traffic to and from the docks of the town, and among the industries are paper, pottery, and earthenware, glass, and brewing manufactures. There is steam tramway connexion with Tongeren, Glons, and Maeseyek, and from the station to Vaals on the German frontier. Pop. (1956) 85,384.

The church of S. Servatius is a 6th century foundation. The 11th century church of Our Lady has been extensively restored and has fine Gothic cloisters. The Stadhuis, completed in 1664, with a clock-tower, stands in the middle of the Groote Markt.

Maastricht was the site of a Roman crossing of the Maas (*Trajectum ad Mosam*), and was the seat of some of the Frankish kings. Unsuccessfully rebelling against the Spaniards in 1576, it was recaptured by them in 1579, by Frederick Henry of Orange in 1632, by the French in 1673, in 1748 under Maurice de Saxe, and in 1794 under Kléber, but resisted a Belgian attack in 1830. The Germans captured Maastricht on May 11, 1940. The bridges over the Maas were blown up, but two bridges on the Albert Canal were left intact. The U.S. 1st army liberated Maastricht—first Dutch town to be freed—Sept. 14, 1944.



Maastricht, Netherlands. Town Hall, built 1658-64; on right, archways and street beneath the church of S. Servatius

Maat. An Egyptian goddess. Linked with Ra and Thoth, she personified physical and moral law, and as the goddess of truth was identified with the Greek Themis. Without temples or offering, she presided in the judgement hall of Osiris when souls were weighed. In figures of bronze, lapis-lazuli, or glass, and in other representations, she wears an ostrich feather and is sometimes blindfold. Judicial officials were often priests of Maat.

Mab, QUEEN. Character in fairy and folk lore. By some writers, e.g. Ben Jonson (*The Satyr*) and Herrick (*Hesperides*), she is referred to as queen of the fairies; by others, e.g. Shakespeare (*Romeo and Juliet*, 1, 4) and Sir Walter Scott (*The Antiquary*), she is described as the fairies' midwife, who delivers men's minds of dreams. The word queen, in this connexion, is used to indicate, not a sovereign, but a woman or queen. Shelley makes his Queen Mab a ruler of men's thoughts.

Mabinogion, THE. Collection of 12 ancient Welsh tales, first published in an English translation by Lady Charlotte Guest in 1838. Mabinogion is derived from Mabinog, an aspirant to bardic honour. The tales comprise 11 prose pieces from *The Red Book of Hergest* (q.v.) and *Taliesin*, which is largely in verse. They are roughly divisible into four groups: 1, Pwyll, Branwen, Manawyddan, and Math, regarded as survivals of Celtic mythology; 2, *The Dream of Maesen Wledic* (Maxentius), and Ludd and Llevelys, old-world Welsh stories; 3, *Kilhwch and Olwen*, *The Dream of Rhonabwy*, *The Lady of the Fountain*, *Percidur*, and *Geraint*, romances connected with the Arthurian cycle; and, 4, *Taliesin* (q.v.).

Mablethorpe and Sutton. Urban district comprising the parishes of Mablethorpe, Trusthorpe, and Sutton-on-Sea, seaside holiday resorts on the coast of Lincs, England. There are rly. stations at Mablethorpe and at Sutton. The district, 13 m. E. of Louth, is the nearest holiday resort for the industrial centres in the East Midlands, and developed rapidly, on account of its 6 m. of sands, good bathing, and bracing air. The whole urban district suffered much destruction in the phenomenally high tide of Jan. 31-Feb. 1, 1953. At the lowest tides a submerged forest and a Roman villa are exposed. Pop. (1951) 5,394.

Mabon (Welsh, bard). Name given to William Abraham (q.v.).

Mabuse, JAN GOSSAERT DE (c. 1472-1532). A Flemish painter. Born at Maubeuge, or Mabuse, in Hainault, he probably studied under Quinten Matsys, and in 1503 was admitted to the guild of St. Luke, Antwerp. He was employed by Philip of Burgundy, and visited Rome with him in 1508, where he studied Leonardo and Michelangelo. At Mechlin, 1516, he painted Leonora of Austria, sister of Charles V, and in 1517 he decorated the castle of Duerstede for Philip. The chief works of his early pre-Italian period are *The Adoration of the Kings*, in the National Gallery, London, Christ in Gethsemane, and portraits of Philip the Fair and Joanna of Castile, at Brussels. Of his later works, the most important include a *Madonna and Child* at Brussels, *Virgin with the Grapes*, in Berlin, about 1509, St. Luke drawing the *Madonna*. He is usually thought to have been the first to introduce into the purity of Flemish painting that alien Italian note which, degenerating rapidly into rococo banality, led to its decline. He died Oct. 1, 1532.

Mac (Gael., son). Celtic prefix of common occurrence in Scottish and Irish names. It answers to Irish O', Norman Fitz, Welsh Ap, Semitic Ben, Ibn, and English -son. It is variously written -Macalister, MacAlister, M'Alister, McAlister. In this work the names of this kind are alphabetised as if the Mac were spelled out.

Macabre. French word meaning grisly, and especially associated with the *danse macabre*, or Dance of Death. It is perhaps so called because the tortures of the seven brothers referred to in 2 Macabees 7 possibly formed the subject of the first pictures of the kind shown in Paris, a theory which accounts at least for the Latin name of the performance, *Chorea Machabeorum*. See Dance of Death.

McAdam, JOHN LONDON (1756-1836). Scottish engineer. Born at Ayr, Sept. 21, 1756, he lived in America from 1770 to about 1785, when he returned to Scotland and purchased an estate at Saughrie, in Ayrshire. There and at Falmouth, where from 1798 he acted as revictualler of the navy, he experimented in the making of roads, and came to the conclusion that

they should be constructed of successive layers of granite or greenstone, broken into small lumps. In 1815, surveyor-general of the Bristol roads, he employed the method he had invented which in time was generally adopted and called macadamising. He received £10,000 from parliament, was appointed surveyor-general of metropolitan roads in 1827, and died Nov. 26, 1836. *Consult* Life, R. Deveraux, 1936.

McAlester. County seat of Pittsburg co., Oklahoma, U.S.A. The city lies 61 m. S.S.W. of Muskogee and has a rly. junction and an airport. Settled about 1885, it was incorporated in 1906. The state's biggest oilfields are near, natural gas is abundant, and coal mines employ many. Lumbering and woodworking, foundries and rly. workshops, and processes connected with cotton are other industries. Pop. (1950) 17,878.

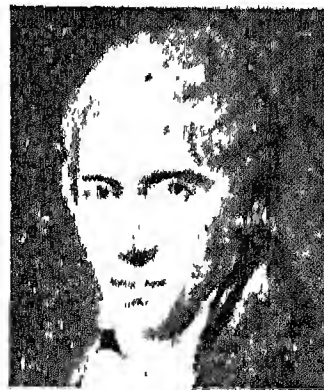
MacAlister, Sir DONALD (1851-1931). Scottish scientist. Born at Perth, May 17, 1851, he was



Sir D. MacAlister,
Scottish man of
science
Russell

educated at Aberdeen, Liverpool, and St. John's College, Cambridge, where he graduated as senior wrangler and first Smith's prizeman in 1877. He was mathematical master at Harrow, studied medicine at Cambridge and at St. Bartholomew's Hospital, London, and made researches in the physiology of heat production under Ludwig at Leipzig. As F.R.C.P., president of the general medical council, and the holder of numerous professorships, he became principal and vice-chancellor of Glasgow university in 1907, remaining until 1929. He edited *The Practitioner*, 1882-91, and was author of an English edition of Ziegler's *Pathological Anatomy*, 1883. He was made K.C.B. in 1908, a baronet in 1921, and died Jan. 15, 1931.

Macalister, ROBERT ALEXANDER SEEWALKER (1870-1950). Irish archaeologist. Born in Dublin, July 8 1870, he directed excavations for the Palestine Exploration Fund, 1900-09 and 1923-24. His work at Gezer was described in *Bible Sites*, 1906, and in exhaustive reports. He also wrote *A History of Civilisation in Palestine*, 1912; *The Philistines*, 1913. Works on Ireland including *Two Irish Arthurian Romances*, 1908, led to his



J. L. McAdam,
Scottish engineer

appointment as professor of Celtic archaeology at Dublin, a position he held until 1913. Later works dealt with early Irish history. He died at Cambridge, April 26, 1950.

McAll, Robert Whitaker (1821-93). A British divine. Born in Macclesfield in 1821 and educated at London university, he became a Congregational minister, and had charge of churches in several towns until 1872. In that year he started the mission work at Belleville, a suburb of Paris, which developed into the McAll mission. He died at Auteuil, May 11, 1893. The Mission Populaire Évangélique de France—in short, the McAll mission—has stations in France, Algeria, and Corsica.

McAlpine, Sir Robert (1847-1934). British contractor, born at Newarthill, Lanarkshire, Feb. 13, 1847. Having served an apprenticeship as a brick builder, he set up in business and within five years he had established himself, his firm being responsible for the erection of large buildings in Motherwell, Hamilton, and other places. He built railways and public works, including the central underground rly., Glasgow, and the Glasgow sewage scheme. By 1918 the firm was known all over the world, and McAlpine was created a baronet. He died Nov. 3, 1934.

Macao. Portuguese overseas prov. (until 1950 colony) at the S. extremity of the West River delta, China, 40 m. S.W. of Hong Kong. Area, including the islands of Taipa and Colôane, about 6 sq. m. Pop. (1950) 187,772. The Portuguese settled here in 1557, and until 1849

paid a tribute to China. In that year payment was refused and the Chinese authorities were expelled from the settlement, but it was not until 1859 that Macao achieved its complete independence. In 1887 China formally acknowledged Portuguese sovereignty.

Macao is administered by a governor with the assistance of a council and legislative chamber. It has played only a small part in the commercial life of the Far East, as few steps were taken to develop the port, which, moreover, was completely eclipsed by Hong Kong. Its main trade consists of the transit of miscellaneous goods, mostly handled by Chinese merchants.

Macaque. Group of monkeys found in S. Asia, and including the Barbary ape occurring in N. Africa and on the rock of Gibraltar. All



Macaque. Specimens of *M. sinica*, the bonnet monkey of India and Ceylon
W. S. Berridge, P.Z.S.

the macaques are of stout build, with longish muzzles and rather large callosities on the buttocks. The tail may be long, short, or absent. They live in troops in the forests, where they lead a very active life, and feed upon almost anything eatable that they can find. The Rhesus monkey, in favour with organ-grinders owing to

its hardy constitution, belongs to this genus, and is found throughout N. India, where it is protected by the Hindus. See Monkey.

Macara, Sir Charles Wright (1845-1929). A British manufacturer. Born Jan. 11, 1845, at Strathmiglo, Fife, Scotland, he was educated in Edinburgh, and became a master cotton-spinner in Lancashire. A leading figure in the cotton industry, he was largely responsible for the Brooklands agreement of 1893, which provided machinery for settling industrial disputes by negotiation. In 1894 he became president of the English federation of master cotton-spinners, and in 1904 of the international federation. He was actively concerned in social and industrial

reform, and wrote a number of books on the subject. A supporter of lifeboat work, he founded in 1891 the Lifeboat Saturday movement. He died Jan. 2, 1929.

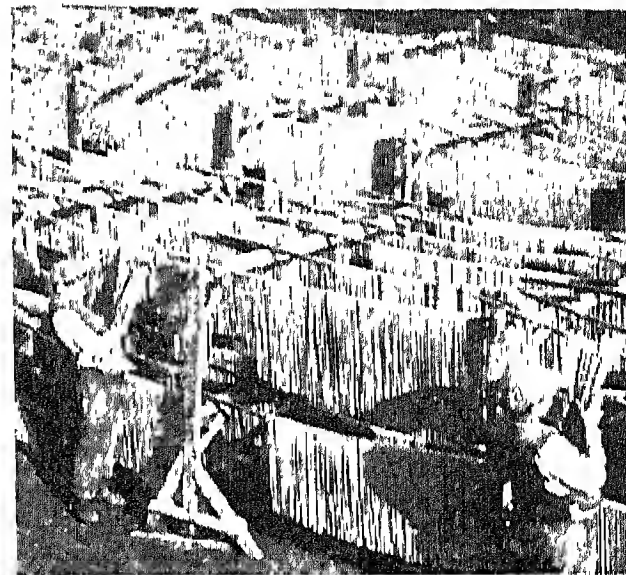
MacArdell, James (c. 1729-65). Irish engraver. Born in Dublin, about 1746 he came to London, where one of his first plates was the humorous Teague's Ramble at Charing Cross, 1747, followed by many portraits from 1748 onwards. His engraving of Van Dyck's portraits of the sons of the duke of Buckingham, 1752, attracted much attention.



James MacArdell,
Irish engraver
Self-portrait

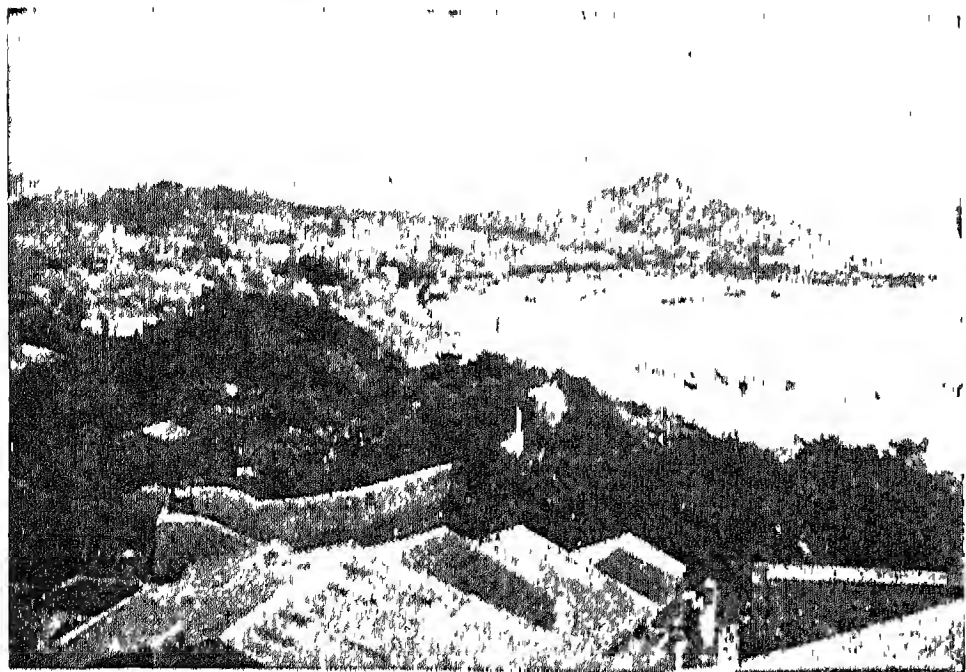
The year 1754 saw the appearance of the first of his series (38 plates) of prints after Sir Joshua Reynolds, Lady Charlotte Fitzwilliam, and the earl and countess of Kildare. Some of his best work was done from portraits by Van Dyck, such as the countess of Southampton, Lords John and Bernard Stuart. He interpreted Gainsborough, Cotes, Lely, also Rembrandt and Rubens. Plates of his own design include Quin as Falstaff and Garrick as Puff in Taste. He produced also a few etchings. His work had great influence on the engravers who followed him. He died in London, June 2, 1765.

Macaroni (Ital. *maccheroni*). A farinaceous food, made from a hard wheat, rich in gluten. After



Macaroni. Lengths of macaroni hanging over rods to dry in the sun

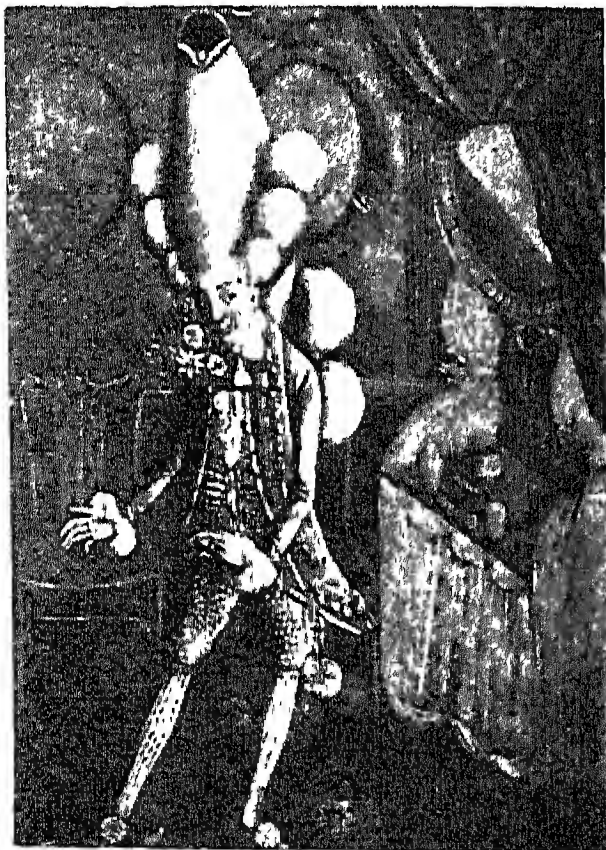
husking, the wheat is ground into flour which is kneaded into a paste. The dough is placed in a cylinder perforated at the bottom, and pressed (by a heavy plate which fits into the cylinder) through the perforations in tubes or strips according to the arrangement of the holes. The macaroni is then cut into lengths and hung over



Macao, China. The bay and town from the south

rods to dry. It becomes soft when boiled and swells a good deal, but retains its shape. Macaroni keeps for any length of time and is a nutritious article of food. The paste of macaroni is made into spaghetti, solid and cord-like, into vermicelli, which is finer than spaghetti, and into various small shapes such as stars, squares, letters, and crescents, used in soup. Formerly made only in Italy, where it forms a staple article of food, it is now also manufactured in the U.K., France and other countries.

Macaroni. Member of an English 18th century clique. They were so called from their introducing that Italian dish into England. Having imbibed Continental tastes and fashions while on the grand tour, a group of young men formed the Macaroni Club, of which C. J. Fox was a prominent member. The Macaronis were conspicuous for affectations and fantastic costumes. The chief features of their dress were large side curls with a knot behind, a very small three-cornered hat, tight short coat, flowered waistcoat, huge white neck-cloth, striped or spotted silk breeches adorned at the knee with bunches of ribbons, white silk stockings, and diamond-buckled shoes. They sometimes wore a hanger, or short curved sword,



Macaroni, as depicted in a print, early 18th century

From *English Costume*, J. Clinch, by courtesy of Methuen & Co., Ltd.

and carried tall tasselled canes. They disappeared before the end of the century.

Macaronic Verse. Ludicrous kind of verse written partly in Latin and partly in vernacular words with Latin terminations. The term is believed to have been

first employed by Teofilo Folengo (1491-1544), a dissipated Benedictine monk, who, under the pseudonym of Merlinus Coccaius, published a volume of *Maccaronea* in 1517. An example in French literature is the burlesque ceremony of admission of Molière's *Malade imaginaire* to the degree of doctor of medicine. *Consult Specimens of Macaronic Poetry*, W. Sandys, 1831.

Macaroon. Name given to a biscuit usually composed of sugar, white of egg, and ground almonds, though sometimes including coconut. The word is a variant of macaroni. See Biscuit.

MacArthur, Douglas (b. 1880). U.S. soldier and administrator. Born Jan. 26, 1880, in Little Rock barracks, Arkansas, the son of Lt.-Gen. Arthur MacArthur, he graduated from West Point in 1903. Commissioned in the engineer corps, he was gassed and wounded in action and promoted from major to temporary brig.-gen. during the First Great War. Made a maj.-gen., Jan., 1925, he was the youngest holder of that rank in the U.S. army. During 1922-25 he was in the Philippines, became commander Philippine dept. 1928, and U.S. chief of staff, with the rank of full general on Nov. 21, 1930. During the next five years he reorganized U.S. defences, enlarged the army air corps, and mechanised the army.

In Oct., 1935, at the request of President Quezon of the Philippines, he relinquished his post in the U.S.A. to become military adviser to the Philippine govt., which appointed him, June 19, 1936, F.M. of the Philippine army. Retiring from the U.S. army Dec., 1937, he continued to act as head of Filipino military and constabulary services. In July, 1941, he was recalled to active service as a lieut.-gen. and given command of U.S. and Filipino forces in the Philippines.

On Dec. 19, 1941, he was restored to the rank of full gen., and, although his forces in Luzon were inferior to the invading Japanese in numbers and material, he slowed down their advance, withdrawing with a mixed force of some 47,000 to



Douglas MacArthur, U.S. soldier and administrator

Bataan pen., W. of Manila. There, lacking air support and receiving no reinforcements, supplies, or ammunition, his men beat off attack after attack, maintaining their position for a month after, on Roosevelt's orders, he had left Bataan, March 11, 1942. His appointment as c. in c. of the newly constituted S.W. Pacific area was announced from his Australian h.q., April 19.

Towards the end of Sept., 1942, Australian and U.S. forces of his command began in New Guinea the counter offensive against the Japanese in his area. In the campaign that followed (described under Pacific War) he led his forces in person in many of their hazardous landings: e.g. on Los Negros in the Admiralty Is., Feb. 29, 1944; on Morotai in the Moluccas, Sept. 14; on Leyte, Oct. 20, 1944, and Ison, Jan. 9, 1945, in the Philippines; on Labuan, June 10, and Balikpapan, July 1, off Borneo.

MacArthur, who had been promoted one of the first four generals of the army at the creation of that rank Dec., 1944, was made, Aug. 1, 1946, commander of U.S. army forces in the Pacific and, after Japan's surrender, supreme commander for the Allied powers in Japan, where he arrived by air Aug. 30, his h.q. at Yokohama. Chief authority for the Allies at the surrender ceremony, Sept. 2, 1945, on board the U.S. battleship *Missouri* in Tokyo Bay, he became virtual dictator of Japan, his aim being to create in Japan something akin to a Western democracy. When war began in Korea, 1950, he was U.N. commander there until recalled by President Truman from all his appointments, April, 1951. Created G.C.B. (hon.), 1943, he received the congressional medal of honour and other decorations.

MacArthur, Mary (1880-1921). Maiden name of Mrs. W. C. Anderson, a champion of the cause of women workers. Born at Ayr, Aug. 13, 1880, she was educated at Glasgow and in Germany. After serving as a clerk in her father's business she became an organizer of shop assistants, was secretary of the women's trade union league, and formed the national federation of women workers. Under the conditions created by the Trade Boards Act, 1909, she organized the chain workers of Cradley Heath, thereby improving the condition of women workers in the Black Country. She did much work in Bermuda-

sey, at the invitation of Queen Mary became hon. secretary of the central committee of women's unemployment during the First Great War, and had a share in promoting the Wages (Temporary Regulation) Act. In 1911 she married W. G. Anderson (d. 1919), Labour M.P. for Attercliffe. She died Jan. 1, 1921.

Macartney, GEORGE MACARTNEY, 1ST EARL (1737-1806). British diplomatist and administrator. He was born May 14, 1737, educated at Trinity College, Dublin, and studied in the Middle Temple. Sent to Russia in 1764, where he successfully concluded a commercial treaty, he became chief secretary for Ireland, 1769-72, and was afterwards governor of the Caribbee Islands, and of Madras. Created an earl in 1792, he was sent as the first British ambassador to Peking, where he was graciously received, but a resident embassy not being conceded by China he returned in 1794, becoming two years later governor of Cape Colony. His health failed and, resigning in 1798, he died May 31, 1806. *Consult* Our First Ambassador to China, H. M. Robbins, 1908.

Macartney, CHARLES G. (b. 1886). Australian cricketer, born June 27, 1886. An all-round player for New South Wales, he first came to oppose England in 1909, succeeding as a slow left-hand bowler. On the 1912 tour he scored 2,207 runs. By 1921 he had so developed his individual style of batting that he headed the Australians' averages in England with 58, playing an innings of 345 against Notts. At 40 "the governor-general" still took the eye among the tourists of 1926, when his batting average was 53 (for test matches 94) and his wickets cost less than 18 runs apiece.

Macartney, SIR SAMUEL HALLIDAY (1833-1906). British army doctor. Born near Castle Douglas, Kirkcubrightshire, May 24, 1833, he studied medicine at Edinburgh university, and graduating M.D. in 1858, entered the army medical department, serving in India and China, 1859-62. He joined the Chinese service in 1863, came into close relations with Li Hung-Chang, was in charge of the arsenal at

Nanking, 1865-75, and was secretary to the Chinese legation in London, 1877-1906. Given mandarin rank by the Chinese government, he was made K.C.M.G. in 1885. He died June 8, 1906.

Macas. Town of Ecuador, in the prov. of Chimborazo. It stands on the Marona river, one of the headstreams of the Marañon, 150 m. S. of Quito. It is built in a valley between two Andean ridges, and is mainly occupied in stock raising and the cultivation of cocoa and tobacco. Pop. 7,000.

Macassar. Capital and seaport of Celebes, Indonesia. It lies in the S.W. of the island, at the mouth of the river Gowa. Already in the 16th century it was an entrepot for the spices of the Moluccas. During the 17th century it was the capital of a kingdom of the same name. There was a Portuguese factory here before the Dutch E. India Co. established its suzerainty over the kingdom in 1667. Exports today include



Lord Macaulay, British historian
After Sir Francis Grant

Macassar oil, pearls, rice, rubber, and tortoiseshell. The Japanese landed near Macassar Feb. 10, 1942, and occupied the town from Feb. 13 until the general Japanese surrender in the N.E.I. Sept. 9, 1945. Pop. 20,000.

Macassar Oil. Vegetable oil used in pharmacy, so called from the district of Macassar, where it is made. The oil is obtained from the fruit of the *Stadtmannea sideroxyton* or *Schleichera trijuga*. The plant yields as much as 70 p.c. of oil, which is used extensively in perfumery. The once extensive use of the oil for the hair brought into use the antimacassar.

Macassar Strait. Channel of the Pacific Ocean. Situated between the island of Borneo and Celebes, it connects the Celebes Sea on the N. with the Java Sea on the S. In Jan., 1942, this strategically important seaway was the scene of a seven-day battle between U.S. and Netherlands warships and aircraft and a large Japanese convoy, escorted by cruisers and destroyers. The convoy was sailing S. with troops and munitions when it was intercepted by allied aircraft on Jan. 23, and a running fight ensued, which continued until Jan. 29. The Japanese losses were 34 ships sunk or badly damaged, with about 25,000 casualties.

Macaulay, THOMAS BABINGTON MACAULAY, BARON (1800-1859). British historian. Born at Rothley Temple, Leicestershire, Oct. 25, 1800, he spent most of his early youth at Clapham, whither his father Zachary Macaulay (q.v.), the son of a Scottish Presbyterian minister, had retired after making a modest fortune as a West Indian and African merchant. After a private school education the young Macaulay entered Trinity College, Cambridge, in 1818. As a boy he had shown extraordinary precocity, writing an epic at ten and a universal history at twelve. His reading was amazingly wide, and everything he read he remembered. Almost incredible stories are told of his power of memory, which he retained all through life. Except in mathematics, for which he had a profound distaste, Macaulay's career at Cambridge was a brilliant one crowned with a fellowship at Trinity in 1824.

Meantime the fortune of Zachary Macaulay had shrunk to small dimensions, largely as the result of philanthropic activities, and at 25 Thomas became the chief support of his family. The publication of his famous essay on Milton in *The Edinburgh Review* was the first effort that brought him fame. The editor, Jeffrey, was particularly struck with the originality of Macaulay's style. The connexion thus begun with the great Whig journal was continued for some twenty years.

Literature chiefly claimed his attention, but he was at the same time turning his mind in the direction of politics. In 1830 he entered parliament as member for Calne, and soon established a reputation as an orator by his speeches in favour of the Reform Bill. In 1833 he was member for Leeds, and in 1834 he

accepted the position of legal adviser to the supreme council of India, with a salary of £10,000 a year. It was chiefly the necessity of providing for his family, whom he dearly loved, that determined this decision. It was by his advice as chairman of the committee of public instruction that European literature and science were made the basis of higher education in India. He also took the leading part in drawing up the penal code. Macaulay's four years' stay in India is reflected in his Indian essays on Clive and Warren Hastings, and it was when abroad that he wrote most of the popular *Lays of Ancient Rome*, published in 1843. In 1839 he was elected member for Edinburgh, and became successively secretary for war and paymaster-general of the forces.

In 1848 appeared the first two vols. of his *History of England* from the Accession of James II, upon which he had been at work for some time. It was his intention to bring it down to a time "within the memory of men still living," but he failed to get farther than the closing years of the reign of William III. The second two volumes appeared in 1855 and the fifth posthumously in 1861. The work enjoyed amazing popularity from the first. Rejected for Edinburgh at the general election of 1847, Macaulay was again elected in 1852, and in 1857 he was raised to the peerage. Two years later, Dec. 28, 1859, he died in London, and was buried in Westminster Abbey.

Macaulay cannot be classed among the greatest historians. Thanks to his extensive reading and prodigious memory he possessed a wide knowledge of many subjects upon which he constantly drew for illustration, often with the happiest effects, but he was not profound. His general outlook, too, was biased by his Whig sympathies, which on occasion led him into misrepresentation of facts, if not into positive inaccuracies. A conspicuous example of his lack of impartiality is to be found in his treatment of Marlborough. Again, he has a tendency to sacrifice absolute truth to the desire for effect, yet with all its faults his *History* will always be read for its brilliant style. As a lucid and picturesque narrator of events Macaulay is almost unsurpassed, e.g. in the famous "third chapter," describing England in 1685. In some respects he is at his best in his many essays on literary and historical subjects. The essay on Robt. Montgomery's

poems (1830) is one of the most devastating pieces of literary criticism ever penned.

Bibliography. Works, coll. by his sister, Lady Trevelyan, 8 vols., 1866; Albany edn., 12 vols., 1898; *Life and Letters*, G. O. Trevelyan, 2 vols., 1876; *Lives*, J. Cotter Morison, 1882; A. S. G. Cumming, new ed., 1913; A. Bryant, 1932.

Macaulay, Dame Rose. British novelist and essayist. She published her first book, *Abbots Verney*, in 1906 and established her reputation as a satirist with *Potterism*, 1920. In a series of witty, incisive novels she exposed the follies of her time. The best known were *Dangerous Ages*, 1921; *Told By An Idiot*, 1923; *Orphan Island*, 1924; *Crewe Train*, 1926; *Keeping Up Appearances*, 1928; *Going Abroad*, 1934. Later novels included *The Towers of Trebizond*, 1956. She wrote a scholarly study of Herriek and his times in *They Were Defeated*, 1932; and her books of literary criticism included *John Milton*, 1933; *The Writings of E. M. Forster*, 1938; and *No Man's Wit*, 1940. She was made D.B.E. in 1958.

Macaulay, Zachary (1768-1838). A British philanthropist. Son of a Scottish minister, and the father of Lord Macaulay (q.v.), he was born May 2, 1768. At 17 he left his father's manse in the W.



Macaw Tree. Head of leaves with nuts

Highlands, and went to Jamaica, where he worked on a sugar plantation, of which he finally became manager. On his return to England he joined Wilberforce and others who were working to suppress the slave trade. Governor of Sierra Leone, 1796-99, he did much to remedy the appalling

conditions there. He was one of the founders of the anti-slavery society (q.v.) 1823. He died May 13, 1838. *Consult* *Life and Letters*, by Viscountess Knutsford; Z. Macaulay, C. Booth, 1934.

Macaw. Name given to various genera of South American parrots, noted for their gorgeous plumage and large size. Some are nearly 3 ft.



Macaw, a South American parrot

long, including the tail; the prevailing colours are red, blue, and yellow. There are about 14 species of typical macaws, found from Mexico to Paraguay. They feed in flocks upon fruits and nuts, and make their presence known by deafening cries. They are hardy in captivity, readily become tame, and will sometimes learn to talk. *See* *Beak*; *Birds*; *Parrakeet*.

Macaw Tree (*Acrocomia sclerocarpa*). Tree of the family *Palmae*, native of South America. It attains a height of about 40 ft., with a spreading head of large leaves divided into slender leaflets, 1 ft. in length, which, when young, are eaten as a vegetable. The yellowish flowers are produced at the base of the leaves. The hard shells of the nuts are made into ornaments, and from the kernels a thick yellow oil is pressed.

Macbeth (d. 1057). King of Scotland. Nephew of Malcolm II, and ruler of Moray, he married Gruoch, granddaughter of the king of Alban, and became King Duncan's commander in chief. He slew Duncan in 1040, succeeded him on the throne, was defeated by Sward earl of Northumbria, in 1054, and was slain by Duncan's son, Malcolm Canmore, at Lumphanan, Aug. 15, 1057. *See* *Scotland*; *History*. *Consult* *History of Scotland*, H. Boece, 1527; *Chronicle of Scottish History*, R. Holmshed, 1578; *Celtic Scotland*, W. F. Skene, 1876-80.

Macbeth. Tragedy by Shakespeare. Macbeth and Banquo, generals of King Duncan of Scotland, meet three witches who predict that Macbeth shall be king. Incited by his wife, he murders Duncan and assumes the crown. Before the murder he sees a dagger in the air; after it, he imagines a voice that cries "Sleep no more!"

Macbeth does murder sleep." Less a hardened villain than a prey to "vaulting ambition that o'erleaps itself," Macbeth next hires two murderers, who kill Banquo. Having consulted the witches again, Macbeth is told that he shall never be vanquished till Birnam wood come to Dunsinane, his castle. His wife, the supreme evil woman in Shakespeare, falls ill, walks in her sleep, talking of the blood on her hand, and dies. Macbeth, observing that the invading English army with Malcolm, eldest son to Duncan, is carrying boughs cut from Birnam wood, perceives the significance of the witches' predictions and abandons hope, to be killed in single combat by Macduff, athane whose wife and children he had caused to be murdered.

Macbeth was written in 1605 or 1606, and first published in the 1623 folio. Shakespeare was indebted to Holinshed, and may have consulted Reginald Scot's *Discoverie of Witchcraft*, 1584. This comparatively short tragedy contains 1,993 lines, including 158 of prose, 1,588 of blank verse, 118 pentametric rhymes, 129 short-line rhymes. No play contains greater poetry, while the imagery derived from animal life and nocturnal phenomena is notable. In theatrical tradition the play is unlucky and must not be quoted from.

Modern revivals in London were by Irving and Ellen Terry (Lyceum, 1888); Forbes-Robertson and Mrs. Patrick Campbell (Lyceum, 1898); Bouchier and Violet Vanbrugh (*His Majesty's*, 1909); Ainley and Sybil Thorndike (*Prince's*, 1926). Others who have essayed the part of Macbeth include John Gielgud, Charles Laughton, Laurence Olivier, Ernest Milton, Donald Wolfit, Michael Redgrave. A modern dress version was staged by Barry Jackson at the Court Theatre, 1928.

McBride, Sir RICHARD (1870-1917). Canadian politician. Born at New Westminster, B.C., Dec. 15, 1870, he was educated at Dalhousie university, Halifax. A barrister, he entered the provincial legislature of British Columbia in 1898, became leader of the Conservative party, and was premier from 1903-15, then agent-general for the province in London. Knighted in 1912, he died Aug. 6, 1917.



Sir Richard McBride,
Canadian politician
Elliott & Fry

MacBride, SEAN (b. 1904). Irish politician, born Jan. 26, 1904, in Dublin. Son of John MacBride, an Irish patriot executed 1916, and his wife, famous as Maud Gonne (1865-1953) in connexion with the Irish independence movement, as a youth he led an I.R.A. brigade in the civil war. After the I.R.A. was declared illegal, he continued his activities with it, and was frequently in trouble with the police. Later, he studied law at Dublin University and founded the reactionary party *Clann na Poblachta*. In 1947 he was elected to the Dáil at a Dublin by-election. In the general election of 1948 his party secured 10 seats, and he was minister for external affairs in the coalition govt., 1948-51, headed by Costello (*q.v.*).

McCabe, JOSEPH (1867-1955). British rationalist. Born at Macclesfield, Nov. 11, 1867, and educated at St. Francis's College, Manchester; St. Anthony's, Forest Gate, London; and Louvain University, he became a Franciscan monk in 1883, a priest in 1890, and rector of Buckingham College in 1895. Leaving the Church in 1896, he earned distinction as a rationalist author and lecturer. He published *Twelve Years in a Monastery*, 1897; *The Twilight of the Gods*, 1923; *The Splendour of Moorish Spain*, 1935; *Testament of Christian Civilization*, 1947, etc., and died in London, Jan. 10, 1955.

Maccabees. Later name of the Hasmonaeans or Asmonaeans, an illustrious Jewish family. In the latter part of the 2nd century B.C. they overthrew Syro-Hellenic tyranny and established a race of priest-kings. Their story begins with Mattathias, an aged priest, who, when ordered to offer sacrifice to the pagan deities at Modin, near Jerusalem, killed the Syrian commissioner, slew a Jew who was about to obey the order, and, with his five sons—John, Simon, Judas, Eleazar, and Jonathan—fled to the mountains. Thus began the successful revolt against the attempt of Antiochus Epiphanes to wipe out Jewish religion and Jewish customs.

After the death of Mattathias, he was succeeded by Judas, the greatest of the brothers, who was called Makkabi or Maccabaeus (Heb. *maqabab*, hammer), Jonathan, and Simon. The race, which gradually degenerated, ended with Mariamne, by whose marriage with Herod (*q.v.*) the dynasty passed to the Idumaeans of the Herodians. The history of the family is tragic as well as

heroic, the climax of tragedy being reached when Herod murdered Mariamne and their two sons.

Die Makkabäer (*The Maccabees*) is the title of an opera by Rubinstein, 1875. See Gezer; Hyrcanus; Jews; Judas Maccabaeus.

Maccabees, BOOKS OF. Four books of the O.T. Apocrypha. Of these 1 and 2 Maccabees, especially the former, are valuable historical works. 1 Maccabees covers the period of Jewish history from the accession of Antiochus Epiphanes to the death of Simon (175-135 B.C.), i.e. the period in which Judas and his brothers waged their struggle for liberty. 1 Maccabees was written originally in Hebrew or Aramaic by a Palestinian Jew between about 100 and 80 B.C. 2 Maccabees covers part of the same ground (174-161 B.C.), but is of less historical value. The author explains that he wishes to delight and profit his readers, and his book has been described (H. T. Andrews, *The Apocryphal Books*) as a tract in favour of unity based on the events of the Maccabean war. The work seems to have been written by an Alexandrian Jew between 60 B.C. and A.D. 1.

3 Maccabees is of the nature of an historical romance, and is not really concerned with the Maccabean age at all. The scenes of the story are Jerusalem and Alexandria in the reign of Ptolemy IV Philopator (222-204 B.C.). The author seems to have been an Alexandrian Jew, but his date is uncertain. 4 Maccabees is philosophical, in the Stoic sense, rather than historical, and is not really Maccabean. It is a homily, sermon, or lecture addressed to the Jews. The author seems to have been a Hellenistic Jew, who wrote immediately before or after the beginning of the Christian era. 1 and 2 Maccabees are regarded as canonical by the R.C. Church. See Apocrypha.

McCallum, Sir HENRY EDWARD (1852-1919). British soldier and administrator. Born Oct. 28, 1852, he became private secretary to Sir William Jervois, governor of the States Settlements, in 1874. He was colonial engineer, Penang, 1880, and surveyor-general of the Straits Settlements in 1884. He was governor of Lagos, 1897; of Newfoundland, 1898; of Natal, 1901; and of Ceylon, 1907, resigning in 1912. He was knighted in 1898, and died Nov. 24, 1919.

Maccaluba. Name given by Sicilians to a mud volcano, particularly to that situated 4 m. W. of Aragona, near Agrigento.

This hill, 135 ft. high, is formed of limestone and clay, and is studded with small cones, 18 ins. to 36 ins. high, filled with mud and emitting sulphuretted hydrogen.

McCardie, Sir Henry Alfred (1869-1933). A British lawyer. Born at Edgbaston, July 18, 1869, he was called to the bar of the Middle Temple in 1894, and in 1916 was appointed a judge of the King's Bench division. His outspoken and unorthodox comments on the sociological aspects of his cases attracted much attention and criticism. Among his cases were the libel action brought by Sir Michael O'Dwyer against Sir Sankaran Nair arising out of the Amritsar incident; and the murder trials of Henry Jacoby and Ronald True. He shot and killed himself, April 27, 1933.

McCarthy, Joseph Raymond (1909-1957). U.S. judge and politician. Born Nov. 14, 1909, at Grand Chute, Wisconsin, the son of an Irish immigrant, he entered Marquette University, Milwaukee, in 1930 and was admitted to the Wisconsin bar 1935. A Republican, in 1939 he was elected a state judge. Joining the Marines 1942, he later served as an air-gunner. In 1947 he entered the U.S. senate, and was re-elected 1952. He first came into national prominence with a speech made at Wheeling, W. Virginia, on Feb. 9, 1950, in which he claimed he had a list of 205 persons known, he alleged, to the secretary of state (Dean Acheson) as Communist party members who were "nevertheless still working and shaping policy in the state department." McCarthy subsequently amended the number to 57, but when called upon by the senate foreign relations committee was unable to produce the name of a single C.P. member employed in the state dept. at the time concerned. He stigmatised the Roosevelt and Truman administrations as "20 years of treason," and by a campaign based on "guilt by association" secured the dismissal of several important officers from the foreign service. In 1953, by reason of seniority, he became chairman of the senate permanent sub-committee on investigations. His allegations of espionage and sabotage at Fort Monmouth, N.J., brought him in 1954 into conflict with the army; and another—the fifth—investigation of McCarthy himself led to the passage of a motion of censure against him by the senate, Dec. 2, 1954. President Eisenhower expressed his own dislike of McCarthy's methods, and the sen-

ator's personal influence waned; but "McCarthyism," as the form of witch-hunting he had introduced came to be called, was not yet a spent force. McCarthy died in hospital at Washington, D.C., May 2, 1957.

McCarthy, Justin (1830-1912). British journalist and politician. Born at Cork, Nov. 22, 1830, he became a junior reporter on *The Cork Examiner*, and in 1853 joined the *Northern Daily Post* at Liverpool. In 1860 he became gallery reporter, in 1861 foreign



Justin McCarthy, British journalist

editor of the *Morning Star*, which he edited 1864-68. Political writer on the *Daily News*, 1872-97, he was a Nationalist M.P. 1879-1900, and chairman of the Irish parliamentary party, Nov., 1890-Jan., 1896. He died April 24, 1912.

His publications in book form included his best known work, *A History of Our Own Times*, 1879-97 and 1905; *Lives of Sir Robert Peel*, 1891; *Leo XIII*, 1896; and *Gladstone*, 1898; *A History of the Four Georges and William IV*, 1884-1901; *Portraits of the 'Sixties*, 1903; *Reminiscences*, 1899; and several novels.

His son Justin Huntly (1860-1936) is best remembered for his play *If I Were King*, 1902, on which the successful musical play *The Vagabond King* was based. His other works included *A History of England under Gladstone*, 1884; *An Outline of Irish History*, 1883; translations of *Hafiz*, *Omar Khayyam*, and the *Arabian Nights*; several other plays, including *The Candidate*, 1884; *My Friend the Prince*, 1897; and a number of novels. He sat in the house of commons as a Nationalist, 1884-92.

McCarthy, Lillah (b. 1875). British actress. Born at Cheltenham, Sept. 22, 1875, she was educated there, and made her first appearance on the stage in 1895. The following year she made her London debut in *The Sign of the Cross*. Her greatest successes were achieved in Shakespearean drama, and in the plays of Barrie, Galsworthy, and Shaw. She created the part of Ann Whitfield in *Man and Superman* (q.v.), 1905, and of Lavinia in *Androcles and the Lion*, 1913; and played in Granville Barker's productions of *Twelfth Night*, and *A Winter's Tale*, 1912. After appearing with

Matheson Lang in *The Wandering Jew*, and *Blood and Sand*, 1921, she retired, reappearing 1932 for a single performance of *Iphigenia in Tauris*. She published *My Life*, 1930; *Myself and My Friends*, 1933. She married (1) Granville Barker (div. 1918); (2) F. W. Keeble (1870-1952) (q.v.).

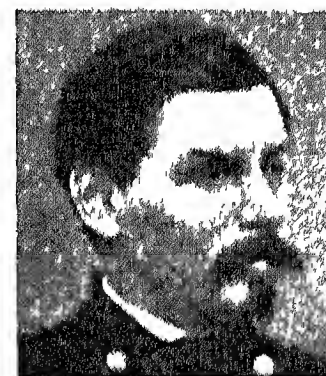


Lillah McCarthy, British actress

McCay, Sir James Whiteside (1864-1930). Irish born Australian politician and soldier. Born at Ballynure, Antrim, Dec. 21, 1864, he was educated at Melbourne University, and became a barrister. He entered the house of representatives of the Commonwealth parliament in 1901 and was minister for defence, 1904-05. In the First Great War he commanded the 2nd Australian infantry brigade in Gallipoli, 1915, and the 5th division in Egypt and France. Later he was in command of the Australian forces in Great Britain, and during 1920-22 was business adviser to the Commonwealth government. Created K.C.M.G. in 1918, he died Oct. 1, 1930.

Macchi. Italian aircraft manufacturers, designers of the racing seaplanes that won the Schneider trophy in 1921 and 1926 and set up world's speed records culminating in Agello's 440 m.p.h. in 1934. In the Second Great War, the Macchi C.200 and subsequent developments were the outstanding fighter aircraft of the Italian air force.

McClellan, George Brinton (1826-85). An American soldier, military writer, and politician. Born at Philadelphia, Dec. 3, 1826, he was commissioned from West Point in 1846. He served as a lieutenant in the Mexican War, and was promoted captain for his services.



G. B. McClellan, American soldier

After the war he was an instructor at West Point and, leaving in 1855, was sent to Europe to study European military affairs. He published *Armies of Europe*, 1856, resigned from the army in 1857, and took up railway work. On the outbreak of the Civil War he was made major general of militia in April, 1861, but was almost immediately promoted to regular

major-general. He dispersed the Confederates at Philippi on June 3. After the Federal defeat at the first battle of Bull Run he was made general-in-chief of the Federal armies, Nov., 1861.

During the winter 1861-62 he did good work in organizing the army of the Potomac, but his plan for the spring campaign did not meet with approval, and he was relieved of the supreme command but left in command of the army of the Potomac. On Pope's defeat at Centreville, McClellan was re-instated and sent to oppose Lee's advance into Maryland in Sept. He defeated Lee at the battle of Antietam, but Lincoln, still distrusting him, adjudged his pursuit lacking in vigour, and replaced him by Burnside. He never commanded again.

At the presidential election of 1861 McClellan appeared as a candidate, putting forward the policy of negotiating with the Confederates, but was badly defeated, and went to Europe until 1868. After his return, he wrote much. He died at Orange, Oct. 29, 1885. He was a brilliant writer and speaker, a good organizer, and not without military gifts; but he was too kind-hearted to be a great leader, and lacked the tact to make him a successful politician. *Consult* Gen. McClellan, P. S. Mickie, 1901.

Macclesfield. Borough and market town of Cheshire, England. It stands on the river Bollin, 18 m.



Macclesfield crest

S. of Manchester. The main church is S. Michael's, rebuilt in the 18th century, restored in 1900; it has two old chapels and other objects of interest. The town has a town hall, hospitals, public baths, public library, museum, water undertaking, etc. The grammar school dates from the 16th century. West Park, Victoria Park, and South Park are public recreation grounds, and there are various public playing fields. In West Park is the old market cross of Macclesfield, four ancient monuments called Saxon stone staffs, and Brocklehurst museum and art gallery. Macclesfield gives its name to a co. constituency; during 1832-85 it had two M.P.s. The chief industry is the manufacture of silk and other fibres; there are also factories making cardboard, cork, shoes, shirts, etc.

Macclesfield became a corporate town in the 13th century, but was probably important earlier. It had

walls in the Middle Ages. Its chief industry formerly was button making, introduced in the 16th century. The first silk mill was built about 1750. The town has fairs and markets, May Fair lasting a week. The Barnaby holidays are held for a week in June. The wild moorland district on the Derbyshire border is called Macclesfield Forest. Market days Fri. and Sat. Pop. (1951) 35,999.

Macclesfield, EARL OF. English title borne by the families of Gerard and Parker. (Charles Gerard (c. 1620-94) belonged to a Lancashire family and fought for Charles I during the Civil War. In 1645 he was made a baron, and during the Commonwealth was in France, being one of the intimates of Charles II. On that king's restoration he was rewarded richly for his loyalty, and in 1679 was made



Macclesfield, Cheshire. Tower and west front of the parish church of S. Michael

earl of Macclesfield. His fall from favour was due to his friendship with Monmouth; but he won the favour of William of Orange, whose supporter he remained until his death in 1694. His son, Charles, the 2nd earl, was sentenced to death for conspiracy, but was pardoned in 1687. The title lapsed in 1702.

A successful lawyer, Thomas Parker (c. 1666-1732), was the founder of the present line of earls of Macclesfield. He became lord chief justice and then lord chancellor, being made a baron in 1716 and an earl in 1721. Later he was impeached for corruption and was fined £30,000. The chief seat of the family is Shirburn Castle, Oxfordshire. An eldest son is called Viscount Parker.

McClintock, SIR (FRANCIS) LEOPOLD (1819-1907). British Arctic explorer. Born at Dundalk,



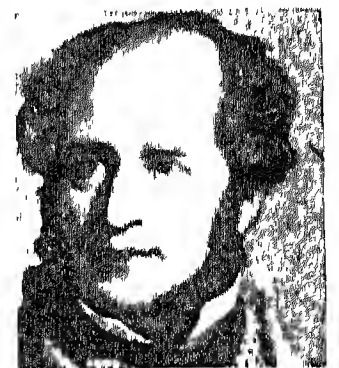
Sir Leopold McClintock, British explorer

Born at Dundalk, July 8, 1819, he entered the navy in 1831. Appointed to the Arctic expedition under Sir James Ross in 1848, he was in 1850 first lieutenant of the Assistance, sent for the relief of Sir John Franklin. Promoted commander on his return, in 1852 he commanded the Intrepid in Belcher's Arctic expedition. In 1857 he was given command of the Fox, fitted out by Lady Franklin, and sailed on another expedition in search of Sir John. In the N.W. of King William's Land he discovered convincing proofs of Franklin's death. Returning in 1859, he was knighted 1860. Rear-admiral in 1871 and vice-admiral in 1877, he was in command of the North American and West Indian stations 1879-82, and became admiral in 1884. He died in London, Nov. 17, 1907. He published an account of the discovery of Franklin's remains in 1859. *Consult* Life, C. R. Markham, 1909.

McClintock Channel. Strait in the Arctic Ocean, between Prince of Wales Island and Victoria Island, British N. America. Through Melville Sound and Banks Strait, to the N.W., it communicates with Beaufort Sea.

McClure, SIR JOHN DAVID (1860-1922). British educationist. Born at Wigan, Feb. 9, 1860, and educated at Owens College, Manchester, and Trinity College, Cambridge, in 1891 he was appointed headmaster of Mill Hill school, which he brought into the front rank. He was knighted in 1913, and died Feb. 19, 1922.

McClure, SIR ROBERT JOHN LE MESURIER (1807-73). A British Arctic explorer. Born at Wexford, Ireland, Jan. 28, 1807, he studied at Eton and Sandhurst and entered the navy in 1824. In 1848 he accompanied Sir James Ross's expedition in search of Sir John Franklin, was promoted commander on his return in 1849, and in 1850 commanded the Investigator on an



Sir Robert McClure, British Arctic explorer

Arctic voyage undertaken by way of Bering Strait. He explored Banks Land, spent two years, 1851-53, on the ice, and after many vicissitudes was rescued by the *Resolute* and returned to England in 1854. He was knighted and promoted captain upon his return, and was voted £10,000 by the house of commons for having discovered and successfully negotiated a North-West Passage. He was promoted rear-admiral in 1867 and retired as vice-admiral in 1873, dying Oct. 17 of the same year.

M'Clure, SAMUEL SIDNEY (1857-1949). British-born U.S. editor and publisher. Born at



S. S. M'Clure
American editor

Process, Antrim, Feb. 17, 1857, of Scottish-French parentage, he was taken at the age of nine to Indiana by his widowed mother. He worked his way through Galesburg College, Illinois. Editor and manager of *The Wheelman*, Boston, Mass., 1882-83, he was associated with the De Vinne Company, New York, 1883-84, and in 1884 established the first newspaper syndicate in the U.S.A. In June, 1893, he founded M'Clure's Magazine, which he edited. By publishing Ida Tarbell's investigation of the Standard Oil Co., M'Clure's Magazine started the "muck-raking" reform movement in American public life. The rapid increase of its sales to 250,000 a month involved M'Clure in heavy debt as advertisement rates for the magazine had been based on an estimated circulation of 40,000. He published his autobiography in 1941. Among his other books was *The Achievements of Liberty*, 1935. He died March 22, 1949.

MacColl, DUGALD SUTHERLAND (1859-1948). British art critic and artist. Born March 10, 1859, he was educated at University College, Oxford. He studied art at the Westminster school of art and the Slade school, and was successively art critic of *The Spectator* and *The Saturday Review*, editor of *The Architectural Review*, and lecturer on the history of art at University College, London. He was keeper of the Tate Gallery 1906-11, then until 1924 director of the Wallace Collection. He was awarded the James Tait Black memorial prize in 1945 for his book on Wilson Steer. He died Dec. 21, 1948.

MacColl, MALCOLM (1838-1907). British cleric. Born at Glenfinnan, Inverness-shire, he was educated at Trinity College, Glenalmond, and in Naples. Ordained, 1859, he became rector of St. George's, City of London. He was canon residentiary of Ripon 1884-1907, and died April 5, 1907. He was an intimate friend of Gladstone.

McCormack, JOHN (1881-1945). British-born American singer. Born at Athlone, June 11, 1881, he studied under Sabbatini at Milan, and first appeared as a concert singer in 1907. He made his debut the same year at Covent Garden in *Cavalleria Rusticana*, and was chosen by Weingartner to sing the part of Don Ottavio in *Don Giovanni* at the Salzburg festival. His success there established him as one of the foremost tenors of the day. Associated with Tetrazzini in many operatic performances, he also appeared with Melba in *La Bohème*. He made his debut in the U.S.A., 1910, later joining the Boston and Chicago opera companies, and frequently singing in London. He became a U.S. citizen in 1917, and was made a count of the papal court in 1928.



John McCormack,
American singer

He died Sept. 16, 1945. *Consult Life*, L. A. G. Strong, 1941.

McCormick, CYRUS HALL (1809-1884). American inventor. He was born at Walnut Grove, West Virginia, Feb. 15, 1809, the son of a farmer. He invented a grain-cutting machine in 1831, and later set up at Chicago a factory for large-scale manufacture of mechanical harvesters. He died May 13, 1884.

McCormick, ROBERT RUTHERFORD (1880-1955). U.S. newspaper proprietor. He was born in Chicago, Ill., on July 30, 1880, and graduated from Yale University in 1903. After studying law at Northwestern University, Ill., he was admitted to the Illinois bar in 1907. In 1910 he became associated with his cousin, Joseph Medill Patterson, as co-editor and publisher of the *Chicago Tribune*. Under their able direction the *Tribune* enormously increased its circulation and advertising, becoming one of the most influential newspapers of the Middle West. It was staunchly Republican and

consistently anti-British. After service in the First Great War, McCormick and his cousin started the illustrated *Daily News* in New York in 1921. McCormick, who used his military title and was commonly called Colonel McCormick, died at Chicago, April 1, 1955.

McCormick, WILLIAM PATRICK GLAN (1877-1910). British ecclesiastic. Born at Hull, June 14, 1877, he was educated at Llandaff cathedral school, Exeter school, and St. John's College, Cambridge. Ordained in 1900, he was curate of All Saints,



"Pat" McCormick,
British ecclesiastic

Shooter's Hill, then became acting Chaplain to the forces in S. Africa, where he was appointed vicar of St. Patrick's, Johannesburg. After serving in the First Great War (he was awarded D.S.O. in 1917) he became vicar of Croydon, 1919; and succeeded H. R. L. (Dick) Sheppard as vicar of St. Martin in the Fields in 1927. "Pat" McCormick was popular as both preacher and broadcaster. He died Oct. 17, 1910.

McCosh, JAMES (1811-94). British-born U.S. philosopher and educationist. He was born at Carrkeoch, Ayrshire, April 1, 1811, and educated at Glasgow and Edinburgh Universities. The publication of his *Method of the Divine Government*, 1850, secured him the professorship of logic and metaphysics at Bellini. Going to America, he was president of the college at Princeton, 1868-87, where he died Nov. 16, 1894. His chief works are: *The Intimations of the Mind*, 1860; *The Scottish Philosophy*, 1874; *The Realistic Philosophy*, 1887.

McCracken, ESTHER HELEN (b. 1902). British playwright. Esther Helen Armstrong, born June 25, 1902, spent eight years with the repertory company in Newcastle on Tyne. She married (1) in 1926 Angus Murray McCracken, D.S.O., M.C. (d. 1943); (2) in 1944 Mungo Campbell. Her first comedy, *Quiet Wedding*, 1938, achieved outstanding success, and was made into a film 1941. A sequel, *Quiet Weekend*, was produced in 1941, and was equally successful. *No Medals*, 1944, was a comedy of the "home front" in wartime, and *Cry Liberty*, 1950, a satire on bureaucracy.

McCracken, Sir Frederick William Nicholas (1859-1949). British soldier. Born Aug. 18, 1859, he was educated at Sandhurst, and joined the 49th Foot in 1879. He was adjutant of the 1st Berks regiment, 1883-85, and served in Egypt, Suakin, and on the Egyptian frontier before he gained the D.S.O. in the S. African War. He commanded the 7th infantry brigade, 1912-14, the 15th Scottish div., 1915, an army corps, 1917-18. He held the Scottish command in 1918-19. Knighted in 1917, he died Aug. 8, 1949.

McCreery, Sir Richard London (b. 1898). A British soldier. He was born Feb. 1, 1898, and educated at Eton and Sandhurst. He served in France during the First Great War, commanded the 12th Lancers, 1935-38, and was promoted major-general in 1943 and lieutenant-gen. 1944. Chief of staff to Alexander in the Middle East 1942-43, he commanded the 10th corps in Italy at Salerno and during the long difficult advance to Cassino; he also planned and executed the crossing, and the simultaneous landing N. of the Garigliano in Jan., 1944. He was appointed to command the 8th army, in succession to Sir Oliver Leese, Nov., 1944. He was G.O.C.-in-C., British forces in Austria from July, 1945, until in March, 1946, he was appointed to command the B.A.O.R. He was British army representative on the U.N. military staff committee, 1948-49. McCreery was created K.C.B. in 1943, G.C.B. in 1949.

McCudden, James Byford (d. 1918). British airman. He went to France at the start of the First Great War as a mechanic attached to the R.F.C. He gained the M.M. in Sept., 1916. Soon afterwards commissioned, he won the M.C. and bar, D.S.O. and bar, and in March, 1918, the V.C. Up to that month McCudden, who had reached the rank of major, had accounted for 54 enemy planes (42 definitely destroyed). He was flying to France to take command of a squadron when he was killed, July 8.



Derek McCulloch,
British broadcaster
and writer

McCulloch, Derek Ivor Breashur (b. 1897). British broadcaster and writer. Born at Plymouth, Nov. 18, 1897, he was educated at Croydon high school, and served in the

in the infantry and R.F.C. He joined the B.B.C. as an announcer, became popular as "Uncle Mac" of the Children's Hour, and during 1938-50 was in charge of that programme. He also published several books, including *Gardening Guyed*, 1931; *Travellers Three*, 1936; *Cornish Adventure*, 1937. Severely wounded in the First Great War, losing the sight of one eye, he also lost a leg as the result of a road accident in 1938.

McCulloch, John Ramsay (1789-1864). A British economist. Born March 1, 1789, at Whithorn, Wigtownshire, he was educated in Edinburgh and became a lawyer's clerk there. In 1817 he became associated with *The Scotsman*, and soon made a reputation as a writer and lecturer on economics. During 1828-32 he was professor of political economy in the university of London; then comptroller of the stationery office from 1838 until his death, Nov. 11, 1864. His books include *A Dictionary of Commerce and Commercial Navigation*, 1832; *Statistical Account of the British Empire*, 1837; *Literature of Political Economy*, 1845. He edited *Smith's Wealth of Nations*, 1828, and *Ricardo's Works*, 1846.

MacCunn, Hamish (1868-1916). British composer. Born at Greenock, March 22, 1868, he was trained at the Royal College of Music, London, and was professor of harmony at the Royal Academy of Music, 1888-94. His overture, *Land of the Mountain and the Flood*, performed at the Crystal Palace in 1887, first brought him into notice, and he followed it up with a succession of works, the chief being the cantatas *Lord Ullin's Daughter* and *The Lay of the Last Minstrel*, and the operas *Jeanie Deans* and *Diarmid*. He died Aug. 2, 1916.

MacDiarmid, Hugh. Pen name of Christopher Murray Grieve, British poet and journalist, born at Langholm, Dumfriesshire, Aug. 11, 1892, and educated at Edinburgh University. A champion of dialect, he was a founder of the Scottish centre of the P.E.N. club and of the Scottish Nationalist political party. His volumes of poetry include *Songschaw*; *Stony Limits*; *Hymns to Lenin*; *The Birlinn of Clanranald* (from the Gaelic). In prose he wrote on the con-



Hamish MacCunn,
British composer
Elliott & Fry

temporary social and political scene in Scotland. In 1950 he was granted a civil list pension of £150 per year. *Lucky Poet*, an autobiography, appeared in 1943.

Macdona, Charles (1860-1946). British theatrical manager. Born in Dublin, he made his first appearance on the stage at Edinburgh in 1884 and his London debut in 1887. In 1921 he formed his own company, *The Macdona Players*, who became celebrated for their performances of Bernard Shaw's plays. He presented revivals of *Diplomacy* and *The Wandering Jew*, produced *On the Rocks* at the Cambridge Theatre in 1934, and appeared as Polonius in *Hamlet*. He died Nov. 15, 1946.

Macdonald. Oldest of the Scottish clans. It is said to be of Pictish origin and have been founded by a descendant of Somerled of the Isles (Gaelic, *Somhairle*, i.e. Samuel), who became powerful as thane of Argyll in the 12th century. By his marriage to a daughter of Olave the Swarthy, king of Man and the Isles, he added the heritage of the last-named to his own possessions. He was slain in battle at Renfrew in 1164, and left four sons. The clan has included the MacDonallds of the Isles and Sleat, Clanranald, Glengarry, Keppoch, Staffa, and the MacIans of Glencoe. MacDonell is a variant.

Macdonald, Sir Claude Maxwell (1852-1915). British soldier and diplomatist. Born June 12, 1852, and educated at Uppingham and Sandhurst, he entered the 74th Highlanders in 1872. Ten years later he went to Cairo as military attaché, and saw some fighting.



Sir Claude M. Macdonald,
British soldier
Elliott & Fry

In 1887 he was acting agent and consul-general at Zanzibar, and as commissioner in S. Nigeria in 1891 took part in the Brass River expedition. In 1896 he went to Peking as envoy extraordinary and plenipotentiary, remaining in that capacity until the Boxer rising and the siege of the legations, June-Aug., 1900, when he commanded the defence. For this he received the K.C.B., and was soon afterwards appointed ambassador at Tokyo, remaining until 1912. He died Sept. 10, 1915.

Macdonald, Etienne Jacques Joseph Alexandre (1765-1840). French soldier. Born at Sedan,



Macdonald,
Duke of Taranto,
French soldier
After David

Nov. 17, 1765, he belonged to a Jacobite family exiled in the cause of James II. He entered an Irish regiment in the service of France, but in 1789 left this to join the revolutionary army. By 1796 he was commanding a division. In 1797 he was made governor of Rome.

Macdonald later served in Switzerland, and in 1809 was given a command in Italy. For his considerable share in the victory of Wagram he was made a marshal, and created duke of Taranto. He served in Spain, was very prominent in Napoleon's concluding battles, and in 1814 went over to the Bourbons. He died Sept. 7, 1840.

Macdonald, FLORA (1722-90). Scottish Jacobite heroine. She lost her parents early, and was brought up by relatives, the Clanranald family, being adopted later by Lady Macdonald of Skye.



Flora Macdonald,
Jacobite heroine
Portrait by
A. Ramsay

In 1746 she assisted in the escape of Prince Charles Edward after Culloden, for which she was arrested and sent to London, where she was detained but kindly treated. When released under the Act of Indemnity in 1747 she was presented with £1,500 by her admirers. In 1750 she married Allan Macdonald of Kingsburgh, emigrating with him to N. Carolina in 1773. During the War of American Independence Allan was made brigadier-general in the British forces, and Flora accompanied him on service until he was taken prisoner of war. By his advice she returned to Scotland, 1779. She died at Kingsburgh, March 5, 1790. See Culloden; consult Life and Times of Prince Charles Edward, A. C. Ewald, 1886; Life of Flora Macdonald, A. MacGregor, 1901.

MacDonald, GEORGE (1824-1905). British novelist and poet. Born at Huntly, Aberdeenshire, the Howglen and Rothieden of his novels, Dec. 10, 1824, he was educated at King's College, Aberdeen, and Aberdeen University. He was a Congregational minister at Arundel from 1850 to 1853, but retired in the latter year and devoted himself to literature, frequently, however, occupying pulpits as a lay preacher. He edited Good Words for the Young, 1870-72, received a civil list pension of £100 in 1877, and died at Ashstead, Surrey, Sept. 18, 1905.

A voluminous writer, whose style expressed a charming personality, his first work, Poems and Essays, was published anonymously in 1851. Phantastes, a Faerie Romance in prose, 1858, was the first of his works to attract general notice. His *George MacDonald* poetical output filled two large volumes, 1893. Ruskin declared his Diary of an Old Soul to be one of the three great religious poems of the 19th century. He was the author of the well-known Where Did You Come From, Baby Dear? and That Holy Thing. His story books for children include Ranald Bannerman's Boyhood, 1871, At the Back of the North Wind, 1871, and The Princess and the Goblin, 1872. Of his novels, some are of a spiritual and mystical character, such as David Elginbrod, 1862; others, such as Alec Forbes of Howglen, 1865, are notable for their presentation of Scottish life and character. Consult Life, J. Johnson, 1906; anthology, ed. C. S. Lewis, 1945.

Macdonald, Sir Hector Archibald (1853-1903). British soldier. Born at Rootfield, Urquhart, April 13, 1853, of humble parentage, he was assistant in a draper's shop for a few years, and in 1870 enlisted in the Gordon Highlanders, so distinguishing himself in the second Afghan War (1879-80) that he was recommended for a commission by Lord Roberts. His great qualities as a soldier had already earned for him the nickname of Fighting Mac. In 1883 he joined the Egyptian constabulary, was subsequently transferred to the Egyptian army, and became noted for his skill in training native troops. The Egyptian brigade which he commanded at the battle of Omdurman, 1898, was chiefly responsible for the victory.



Sir Hector Macdonald,
British soldier
Lafayette



Elliott & Fry

In 1899 Macdonald was sent to South Africa to take command of the Highland brigade. In May, 1902, he was given the command of the troops in Ceylon, but in the following year a grave charge was brought against him. He returned to London, but was ordered by the war office to submit himself to a court of inquiry in Ceylon, and on his way thither shot himself in Paris, March 25, 1903. There is a memorial tower at Dingwall, Ross-shire, completed 1907. During the First Great War there were absurd rumours that Macdonald, still alive, held a German command.

MacDonald, JAMES RAMSAY (1866-1937). British statesman. Born at Loudmouth, Morayshire, Oct. 12, 1866, he was educated at the village school there. He went to London in 1884 intending to study for the teaching profession, maintaining himself meanwhile as a clerk. Becoming private secretary to an Irish politician, he also began to make his way as a journalist. He joined the Independent Labour Party in 1894, and unsuccessfully contested Leicester in the election of 1895. It was largely through his efforts that the trade unions agreed to collaborate in the I.L.P., a move which led to the formation of the Labour party in 1900. MacDonald, as secretary, drafted its constitution.

He was again defeated in the 1900 election, but was returned in 1906, becoming leader of the party in 1911. Opposing Great Britain's entry into the First Great War, against the majority of his party, in 1917 he publicly supported a revolutionary movement on Russian lines; as a result the National Seamen's and Firemen's union refused to allow him to sail when he wanted to visit Russia. He was also unable to attend an international peace meeting at Stockholm, as a passport was refused. His resulting unpopularity cost him his parliamentary seat in 1918, and he did not return until 1922, as M.P. for Aberavon. By this time his firm opposition to the Communists had restored his popularity within the party, of which he resumed his leadership, this giving him also the leadership of the opposition. As a result of the 1923 election, he became, with Liberal support, the first Labour prime minister (Jan.



J. Ramsay MacDonald,
British statesman

1924), taking over the foreign secretaryship as well. His ministry was short-lived, as he was defeated in Oct. on an opposition motion calling for an inquiry into the dropping of a charge of sedition against a communist pamphleteer. MacDonald narrowly retained his seat in the next election, when the Conservatives returned to power.

In 1929 he was elected M.P. for Seaham Harbour, and again became premier, though again of a minority government. Increasing unemployment, together with the decline of trade, forced MacDonald in 1931 to put before his colleagues drastic measures of retrenchment, based on the findings of the May committee. These, especially the proposal for a "means test" (*q.v.*) for unemployment pay, were unacceptable to the majority of the cabinet, who refused their support. MacDonald found the Conservatives and most Liberals ready to support an all-party government, which he formed in Aug., 1931, with small support from Labour - those Labour members who followed him being rejected by the Labour Party and taking the name National Labour. A general election in Oct. returned this "National" government with a huge majority; but the new house was predominantly Conservative and MacDonald's position was therefore somewhat anomalous. He had to meet fierce opposition from Labour members who accused him of "selling the pass."

After a visit to Washington to discuss the British debt to the U.S.A., MacDonald showed many signs of overstrain. His speeches became noticeably more vague and evasive. It was at this period that Winston Churchill termed him "the boneless wonder." This overstrain led MacDonald to resign the premiership to Baldwin in 1935, in exchange for the office of lord president of the council. In the 1935 election, he lost his seat by 20,000 votes. But he remained in office, and was elected in Feb., 1936, for the Scottish Universities. In May, 1937, he resigned from office, and later set out for South America, dying on the voyage, Nov. 9, 1937.

At his best, MacDonald was a persuasive orator; he was also a prolific political writer. His tenure of the foreign secretaryship in 1923 was considered generally successful. It fell to him to set many precedents on the first advent of Labour to government, and this he contrived to do with appreciable tact and dignity. His wife, Mar-

garet Ethel Gladstone (d. 1911), whom he married 1896, profoundly influenced his career. A pleasing memorial to her stands in Lincoln's Inn Fields. *Consult* Lives, H. A. Tiltman, 1929; M. A. Hamilton, 1931; L. M. Weir, 1938; Lord Elton, 1939.

MacDonald, JEANETTE (b. 1907). American film actress and singer. Of Scottish-Irish descent, she was born at Philadelphia, June 18, 1907, educated there, and made her debut on the stage in revue, when a child. Her powerful soprano voice attracted attention, and she made a success in the New York production of *Irene*, 1920. She entered films under the auspices of Lubitsch who directed *The Love Parade*, 1929, in which she played opposite Maurice Chevalier. She scored success in a series of musical films, in which she played opposite Nelson Eddy, *e.g.* *Rose Marie*, 1936; *Bitter-Sweet*, 1941. Other of her films included *San Francisco*, 1937; *Smilin' Through*, 1942; *Cairo*, 1943; and *Three Dancing Daughters*, 1948.

Macdonald, SIR JOHN ALEXANDER (1815-91). Canadian politician. Born in Glasgow, Jan. 11, 1815, he went as a child to Canada, where he was called to the bar in 1836, and in 1844 became a Conservative member of the legislature. In 1847 he joined the government as receiver-general, and after six years in opposition was attorney-general of Upper Canada 1854-57, when he became prime minister of the two Canadas.

Canada was passing through a critical stage, and Macdonald's solution of the many difficulties was federation of the various provinces. When in 1867 the federation was accomplished, Macdonald was knighted and became, until 1874, the first prime minister of the new union.

He returned to power in 1878, remaining premier until his death, May 29, 1891. He was also influential in promoting the building of the Canadian Pacific Rly. A supreme manager of men, and of groups of men with contending interests, he did much to develop the resources of the north-west. *Consult* Life, D. G. Creighton, 2 vols., 1952, 1956.

His widow Susan Agnes (d. 1920) was made Baroness Macdonald of Earncliffe, Aug. 14, 1891.

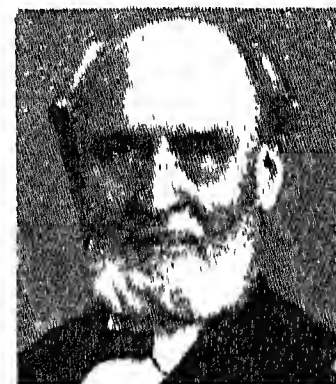
MacDonald, MALCOLM (b. 1901). British politician and administrator. Younger son of J. Ramsay MacDonald



Malcolm MacDonald,
British politician and
administrator

(*q.v.*), he was born at Lossiemouth, Morayshire, and educated at Bedales school, and Queen's College, Oxford. He entered parliament in 1929 as Labour member for Bassetlaw, and was parliamentary under-secretary, Dominions office, 1931-35, becoming a privy councillor in 1935. He was Dominions secretary in 1938 and was appointed minister of Health in 1940. He was U.K. high commissioner in Canada, 1941-46; first governor-general of the Federation of Malaya and Singapore, 1946-48; U.K. commissioner-general in S.E. Asia, 1948-55; U.K. high commissioner in India from 1955. Leader of the small National Labour party from 1937, he did not stand for re-election in 1945.

Macdonald, SIR WILLIAM CHRISTOPHER (1831-1917). Canadian philanthropist. Born at Glenaladale, Prince Edward I., the son of a president of the legislative assembly of the island, he made his fortune in Montreal in the tobacco business. He devoted large sums to the promotion of education, founding the Macdonald agricultural college at Ste. Anne de Bellevue, Quebec, at a cost of about £1,000,000, and making munificent donations to McGill University and Ontario agricultural college. He was knighted in 1898, and died June 11, 1917.



Sir William Macdonald,
Canadian
philanthropist

Macdonell, ALESTAIR (c. 1725-61). Scottish Jacobite. The thirteenth chief of Glengarry, he became an officer



Alestair Macdonell,
Scottish Jacobite

in the Royal Scots Regiment, then in the service of France. In 1744 he went to Scotland on a Jacobite mission, and in the following year was captured

at sea while bringing assistance to Prince Charles Edward, then in Scotland. Some time after his release he appears to have acted as a spy upon the prince, signing his dispatches to the English Government with the sobriquet of "Pickle," a name which Andrew Lang made familiar by his book *Pickle the Spy*. He kept closely in touch with the Jacobite party on the Continent and betrayed many of its members, but never seems to have been suspected. He succeeded to the Macdonell estates in 1754, and died Dec. 23, 1761.

Macdonnell, ARCHIBALD GORDON (1895-1941). British writer. Born Nov. 3, 1895, and educated at Winchester, he became one of the leaders of the younger school of satirical writers, his best-known work being *England Their England*, 1933, in which the incongruous and scholarly appreciations were delightfully mingled. *Napoleon and His Marshals*, a serious historical study, was a notable early work. His other books included *A Visit to America*, 1935; *Lords and Masters*, 1936. A frequent broadcaster in the B.B.C. Empire service, he died at Oxford, Jan. 1941.

Macdonnell, JAMES (1842-79). British journalist. Born at Dyce, Aberdeenshire, April 21, 1842, a member of an old Highland family, he was educated at Bell's school, Inverness, and at the parish schools of Dufftown and Rhynie. After a period on the staff of various Scottish newspapers, he joined the *Daily Telegraph* in 1865, serving as special correspondent in France, 1870-71; and was a leader-writer on *The Times*, 1875-79, making a special study of constitutional problems and French politics. He died in London, March 2, 1879. His valuable but unfinished sketch of contemporary French politics, *France since the First Empire*, was edited by his widow and published 1879.

Macdonnell Range. Mountain range of Australia, in the Northern Territory. It lies along the tropic of Capricorn, and its elevation causes rainfall, which is drained away by many streams, mostly terminating abruptly in the dry lowland. The overland telegraph crosses the range N. of Alice Springs. The Arltunga goldfield at the E. end became famous in 1903.

Macdonogh, SIR GEORGE MARK WATSON (1865-1942). A British soldier. Born March 4, 1865, he entered the Royal Engineers in 1884. He became general staff officer, War office, in 1912 and was

promoted major-general for services in the field in the early months of the First Great War, being in charge of military intelligence from 1915 to 1918. In the latter year he was promoted adjutant-general, and in 1919 lieutenant-general. He was knighted in 1917, retiring from the army, 1925. In 1933-34 he was president of the federation of British industries. He died July 10, 1942.

Macdougall, WILLIAM (1822-1905). Canadian statesman. Born at Toronto, Jan. 25, 1822, he entered the Canadian parliament in 1858, and held various government posts. In 1866 he was minister of Marine during the Fenian troubles, and was sent to London with other delegates to confer with the imperial authorities on questions which had arisen between the several North American possessions. In 1868 he became the first lieutenant-governor of Rupert's Land. He died May 29, 1905.

McDougall, WILLIAM (1871-1938). British psychologist. A native of Lancashire, he studied medicine and later became reader in mental philosophy at Oxford and at University College, London. He was subsequently professor at Harvard university, 1920-27. McDougall's main importance lay in his perception of the essential connexion between physiology and psychology, his doctrines being expounded in many books, of which the most important were *Body and Mind*, 1911; *The Group Mind*, 1920; *Outline of Psychology*, 1923; *Energies of Man*, 1932. In these he showed himself an opponent both of the Freudian and of the Pavlovian schools. He died Nov. 28, 1938.

MacDowell, EDWARD ALEXANDER (1861-1908). An American composer. Born at New York, Dec. 18, 1861, he studied piano-playing in Europe, and obtained a teaching appointment at Darmstadt conservatoire, where Liszt helped to introduce him to public favour. Returning to the U.S.A. in 1888, he settled in Boston. He became professor of music at Columbia university, 1896, but resigned in 1904, and died Jan. 24, 1908.

MacDowell's compositions include the Indian suite, several orchestral symphonic poems, songs,

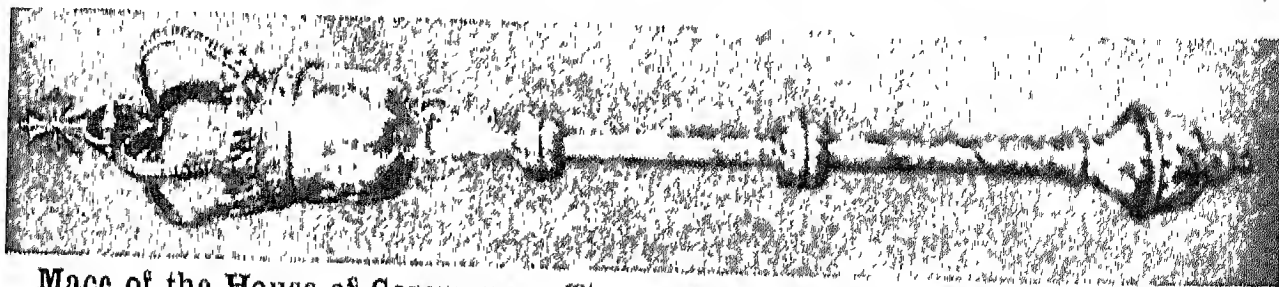
and choruses, and a great number of highly popular piano pieces, of which the best known are probably *Moon Pictures*, *Woodland Sketches*, *Sea Pieces*, and *Fireworks Tales*. *Consult Life*, J. F. Parke, 1922.

McDowell, IRVIN (1818-85). American soldier. Born at Columbus, Ohio, Oct. 15, 1818, he was educated at West Point. He first saw service in the Mexican War, and during the Civil War was in command of the army of the Potomac. His defeat at the first battle of Bull Run in 1861 led to his being superseded by McClellan. As a corps commander he was subsequently engaged at the battle of Cedar Mountain and the second battle of Bull Run. He died at San Francisco, May 4, 1885.

Macduff. Burgh and seaport of Banffshire, Scotland. It stands on the Moray Firth, at the mouth of the Deveron, 16 m. N.W. of Aberdeen. It has a railway station. Across the Deveron in Banff, a bridge connecting the two. Its harbour, with, in addition, a basin and a shipway, constructed in the 20th century, has facilities for shipping. Apart from the fisheries, the industries are connected with shipping, boat-building, engineering, agriculture, etc. Macduff was a fishing village named Doune before the superior, the duke of Fife, renamed it Macduff, the family name. It was created a burgh of barony of regality in 1783. The town is a favourite summer resort; an open air swimming pool and an 18 hole golf course at Tarlair are elements in its popularity. Pop. (1951) 3,392.

Macduff. Thane or earl of Fife. A semi-legendary figure of the 11th century, he is mentioned by early Scottish historians as having conspired with Malcolm Canmore to overthrow the usurper Macbeth. Threatened by Macbeth, he fled to England, and although his castle was destroyed, the tale that his wife and children were massacred has no foundation in fact, although it was utilised by Shakespeare for dramatic purposes. By his aid Malcolm defeated Macbeth at Lumphanan in 1057.

Mace (Fr. *Massé*). Heavy headed staff or club, formerly much used in close combat, particularly to protect the king's person, and frequently borne in battle by



Mace of the House of Commons. The staff was made in 1649, and the head, with royal initials and symbols, was added at the Restoration

ecclesiasties, to whom the sword was a forbidden weapon. It is now a symbol of authority, *e.g.* the mayoral mace. The mace of the house of commons is the emblem of the Speaker's authority as the servant of the house, and is removed from its place on the table when the Speaker leaves the chair and the house goes into committee, or rises or when the sitting is suspended. It was the mace to which Cromwell was referring when, as alleged, he exclaimed "Take away that bauble," thereby dismissing the Long Parliament.

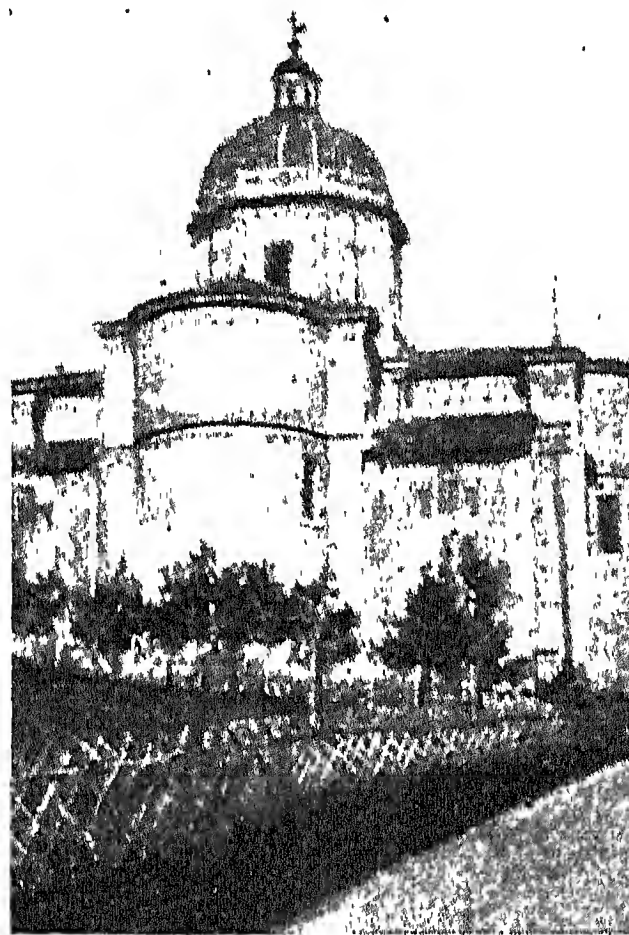
Mace. Fleishy, inner covering, or aril, of the nutmeg, which, dried in the sun, is used as a spice. When fresh it is a bright red, but on drying it fades to a brown. It is very aromatic, and contains both an essential and a fixed oil. *See* Nutmeg.

Mace, JEM (1831-1910). British pugilist. He was born at Beeston, Norfolk, April 8, 1831. He suddenly acquired fame by beating Bob Brettell, 1860, and then the holder of the championship, Sam Hurst, June 18, 1861. As champion of the ring, a title he held intermittently until his retirement in 1871, he won a contest, and lost another, with Tom King; afterwards occurred his battles with Joe Goss, of which he won two, the other being drawn. He died Nov. 30, 1910.

Macedonia. In ancient geography, country of S.E. Europe, situated N. of Hellas, properly so called. It was bounded S. by Thessaly and the Aegean Sea, E. by Thrace, and W. by Illyria. The chief rivers were the Lydias, Strymon, and Axios (Vardar); the chief towns Edessa, Pella, Pydna, Philippi, Potidaea, and Thessalonica, the two first being in succession the capital, while Thessalonica is well known in connexion with S. Paul. Macedonia was famous for its salt, gold, and silver mines, and for its vineyards. The people, although regarded by the Greeks as semi-barbarians, were undoubtedly of Hellenic race. They spoke the Greek language, and had probably stayed behind in the north during the advance of the rest of the Greeks southwards.

Some of the earlier kings endeavoured to improve the conditions of the country, patronised Greek men of learning, and introduced Greek culture, but it was not until the reign of Philip II (359-336 B.C.) that Macedonia became important, reaching the climax of its greatness under his successor, Alexander the Great. At his death

(323) the Macedonian empire included Macedonia, Greece, Thrace, Asia Minor, Syria, Egypt, Babylonia, Assyria, part of modern Persia, Afghanistan, Baluchistan, and Central Asia. Under the Diadochi, or successors of Alexander, these possessions were contested among various claimants. After a period of civil wars, Antigonus Gonatas established himself firmly on the throne of Macedonia in 278. Later its kings came into collision with the Romans. After the battles of Cynoscephalae, 197; Pydna, 168; and the futile rising of the pretender, Andriscus, 148, also defeated at Pydna, Macedonia in 146 became a Roman province. After the division of the empire into E. and W., in A.D. 395, Macedonia became one of the divisions of the prefecture of Illyricum. It was settled by Slavs in the 6th



Macerata, Italy. Church of S. Maria delle Vergini, built 1573, outside the city walls

century, and in the 13th century it was formed by the Crusaders into the kingdom of Thessalonica, which was bestowed upon Boniface of Montferrat. In the 15th century, with the rest of Greece, it came into the power of the Turks.

In current usage the name is applied to an area in N. Greece and S. Yugoslavia, bounded roughly by the Crna Gora to the N., the Albanian frontier mts. to the W., the river Mesta to the E., and S. by a line following the river Vistritza to reach the sea at Mt. Olympus. Salonica is the chief town. The Yugoslav part is a federative republic (capital, Skoplje) of Yugoslavia. Tobacco is the main crop.

Macedonia has always been a centre of unrest. Turkish until

the Balkan Wars 1912-13, it was then divided between Bulgaria, Greece, and Serbia; the Bulgarian portion was ceded to Greece after the First Great War. The German invasion of Greece, April 6, 1941, took place through Macedonia, which was overrun within a few days. Bulgaria immediately annexed the E. of the country, but at the end of the war the boundaries reverted to those of 1910.

Communist disturbances broke out in 1944 in Greek Macedonia, where civil war raged from 1946 until early 1949.

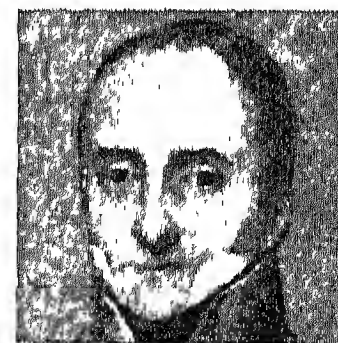
Maceio or **MAÇAYO.** Seaport of Brazil, and capital of the state of Alagoas. It stands on a small peninsula between the sea and the Lagoa do Norte, on which its port Jaraguá is situated. Cotton goods and machinery are manufactured; there is an American meat packing house; and a trade is carried on in sugar, rum, castor-oil seed, hides, and skins. It is linked by road and rly. with Pernambuco, 130 m. N.E. Pop. (1950) 99,088.

Macerata. Province of the Marches, N.E. Italy. Bounded N. by Ancona, S. by Ascoli Piceno, E. by the Adriatic Sea, and W. by Perugia, it is traversed by spurs of the Apennines, and watered by the rivers Potenza and Chienti. Area 1,070 sq. m. Pop. (1951) 297,839.

Macerata. City of Italy, in the Marches, capital of the prov. of Macerata. It stands at an alt. of 918 ft., between the rivers Chienti and Potenza, 17½ m. by rly. W. of Porto Civitanova. Enclosed by ancient walls and towers, it has a cathedral, and several handsome churches, a well-stocked library, a medieval town hall, and several ancient palaces. The small university dates from 1290. The chief industries are the manufacture of glass and chemicals. Macerata was founded after the destruction of Ricina by Alaric, in 408. The city was captured undamaged, July 1, 1944, by the Allied 8th army. Pop. (1951) 32,303.

Maceroni, FRANCIS (1787-1846). British soldier and inventor. Born in Manchester, of Italian and English parentage, July 25, 1787, he went to Italy in 1803, entered the Neapolitan army, rose to colonel's rank,

saw active service, and in 1814 became aide-de-camp to Murat, king of Naples, who sent Maceroni on a diplomatic mission to

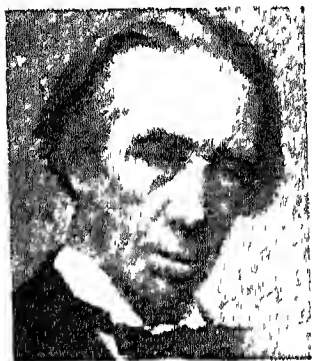


Francis Maceroni, soldier and inventor

England. He settled there on Murat's fall, and invented a steam road car, which plied between London and Brighton in 1834, and propounded plans for asphalt paving, street lighting, and flying machines. Maceroni died July 25, 1846. *Consult* his Memoirs, 2 vols., 1838.

McEvoy, AMBROSE (1878-1927). British painter. Born at Crudwell, Wilts, Aug. 12, 1878, he studied at the Slade, where he met John and Orpen. His early interiors with figures were influenced by Dutch masters, but he later developed a personal style in landscape and portraiture. In portraits he was most successful with women, e.g. the duchess of Marlborough, the countess of Wimborne. He is represented at the Tate, London, and the Luxembourg, Paris. A.R.A. from 1924, he died Jan. 4, 1927.

Macfarren, SIR GEORGE ALEXANDER (1813-87). British composer. He was born in London,



Sir G. A. Macfarren,
British composer

March 2, 1813, entered the Royal Academy of Music in 1829, and was appointed professor of harmony there in 1837 and principal in 1875. He did much to raise the

standard of British orchestration, and was a voluminous and scholarly composer. Conductor at Covent Garden for 30 years, from 1845, he was then appointed professor at Cambridge. He became totally blind in 1865. He was knighted in 1883, and died Oct. 31, 1887. His principal works are *The Devil's Opera*, 1838; *May Day* (cantata), 1857; *Robin Hood*, 1860; the oratorios *The Resurrection*, 1876, and *King David*, 1883.

Macgill, PATRICK (b. 1890). Irish writer, born in Donegal. From 12 to 19 he did odd jobs on farms and as a navvy. Having published a volume of verse, *Gleanings from a Navvy's Scrap Book*, he joined the *Daily Express*, and in 1912 received an appointment in the library at Windsor. With the London Irish in the First Great War, he saw much service on the western front, about which he wrote *Red Horizon*, 1916; *The Brown Brethren*, 1917. A strikingly realistic novel of labouring life was *Children of the Dead End*, 1915. Other stories were *The Rat-Pit*; *Sid Puddiefoot*, 1926; *Una Cassidy*, 1928; *The House at the World's End*, 1935. A play, *Suspense*, was acted in 1930.

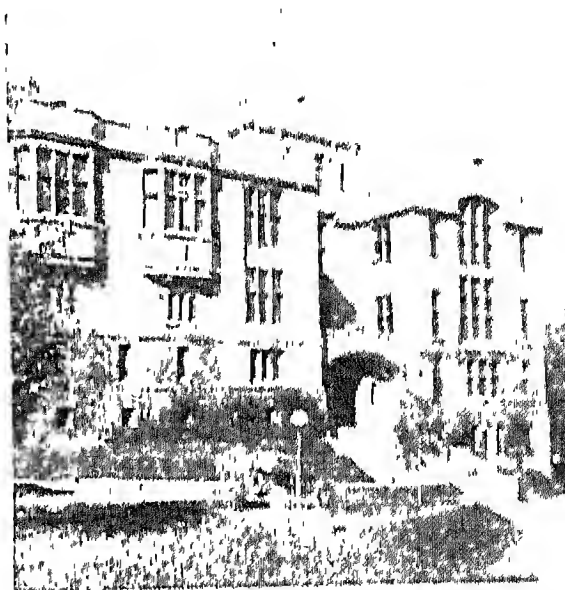
McGill University. Canadian university. It owes its origin to property left by James McGill of Glasgow, who died in Montreal in 1813. It was incorporated in 1821 and 1852. Many benefactions have been received from citizens, including Sir W. Macdonald and Lord Strathcona.

The university consists of McGill, the original college in Montreal, the Workman building, the Macdonald colleges for physics, engineering, chemistry, and mining, the old and new medical buildings, and the Royal Victoria College, Victoria, opened in Montreal in 1899, is the women's department; it was built and endowed by Lord Strathcona. Macdonald, at St. Anne de Bellevue, is devoted to agriculture. McGill has large libraries, laboratories, an observatory, a farm, hospitals, and a medical museum. It is specially famed for its teaching of engineering and medicine. Music, teaching, household science, and commerce are other departments. Four theological colleges in Montreal are connected with the university, which has residential facilities for both men and women. It is under a board of governors, who unite with members of the staff to form the corporation.

Macgillicuddy's Reeks. Group of mts. in co. Kerry, Eire. They lie to the W. of Killarney, and include Carrantuohill (the inverted reaping hook), 3,414 ft., the highest summit in the country; Beenkeragh, 3,314 ft.; Caher, 3,200 ft.; Curraghmore, 2,695 ft.; Feabrahy, 1,894 ft.; Brassel, 1,888 ft.; and Drishana, 1,490 ft. In the basin between the Reeks and the Mangerton group are the famous lakes of Killarney. The ascent of Carrantuohill is an exacting climb, but the summit, composed of shingle, commands magnificent views.

McGovern, JOHN (b. 1887). Scottish politician. He was born Dec. 13, 1887, and served his apprenticeship before becoming a master plumber in 1909. He entered parliament in 1930 as I.L.P. member for Shettleston, Glasgow. During 1931-33 he was arrested and imprisoned for offences committed in the name of free speech during demonstrations

by the unemployed, and made a protest in the house of lords during the king's speech against the failure to restore unemployment relief and end the meanest. In 1934 he led a Glasgow to London hunger march. He retained his seat in the elections of 1945 and 1950, resigning from the I.L.P., however, in Nov., 1946, and joining the Labour party in 1947.



McGill University, Montreal. Part of the medical building
courtesy of Canadian Pacific Rly.

McGowan, HARRY DUNCAN

McGOWAN, 1st BARON (b. 1874). A British industrialist. He was born in Glasgow, June 3, 1874, and joined Nobel's explosive company in 1889, becoming managing director in 1918. President of Imperial Chemical Industries in 1926, he became chairman on the death of Lord Melchett in 1930, and was also managing director until 1938. His other interests were banking and insurance. He received a knighthood in 1918 and was raised to the peerage in 1937.

Macgregor, JOHN (1825-92). Scottish traveller, known as Rob Roy. The son of a soldier, he was



John Macgregor,
Scottish traveller

born Jan. 24, 1825. After education at Trinity College, Dublin, and Trinity College, Cambridge, he became a barrister. His time was mainly passed in

travel, a notable feat being a journey in his canoe, Rob Roy, over the waterways of Europe, this being something of a pioneer undertaking. His writings include *A Thousand Miles in a Rob Roy Canoe*, 1866. He travelled also in America and other continents. Macgregor was interested in work among boys, being associated with Lord Shaftesbury in philanthropy, and was a member of the first London school board. He died July 16, 1892. *Consult* Life, E. Hodder, 1894.

Mach, ERNST (1838-1916). An Austrian physicist. He was born Feb. 18, 1838, at Turas in Moravia. Professor of mathematics at Graz, 1864, of physics at Prague, 1867, and finally at Vienna from 1895 to 1901, Mach was the leading

exponent in his day of physical psychology, and developed a theory about man's relation to his surroundings which had a bearing on Einstein's principle of relativity. *Analysis of Perceptions*, 1886, was perhaps the best known book by Mach. On retiring he was made a member of the Austrian house of peers, dying Feb. 9, 1916. See Mach Number.

Machado, BERNARDINO (1851-1944). A Portuguese statesman. Born July 28, 1851, at Rio de Janeiro, he went to Portugal and in 1882 entered parliament. A republican, he was a member of the government after the revolution of 1910. Prime minister when the First Great War broke out, he declared that in all circumstances his country would be sympathetic towards her old ally, Great Britain. Machado became president in 1915, but in a revolution two years later was arrested and exiled. He was again prime minister in 1921, president 1925-26, and exiled 1927. He died April 29, 1944.

Machado, MANUEL (1874-1947). Spanish writer. Educated at Seville university, he joined his brother Antonio (d. 1939) and J. R. Jimenez in a literary movement which stirred the national spirit at the beginning of the 20th century. He brought out arrangements of plays by Lope de Vega, and produced a play (in collaboration with his brother), *Desdichas de la Fortuna*, 1926. He will probably be remembered most by his Andalusian poetry, one of his finest pieces being a sonnet to de Falla. He died in Madrid early in 1947.

Machaerodus (Gr. *machaira*, sword; *odous*, tooth). Extinct genus of cats. Known as sabretoothed tigers, they had enormous upper canine teeth, 8 to 10 ins. in length. Fossil remains are found in Pleistocene strata in Europe and America, and show the creature to have been about the size of a tiger. The teeth were probably used as stabbing instruments.



Machaerodus. Reconstruction of this prehistoric member of the cat tribe

Macheath, CAPTAIN. Chief male character in *The Beggar's Opera* (q.v.), by John Gay. He is a highwayman, but the action is chiefly concerned with his audacious amours in and out of jail, specially with Polly Peachum and Lucy Lockit. Among his songs are the well-known "How happy could I be with either!" and "When the heart of a man is depressed with cares."

Machen, ARTHUR (1863-1947). British writer. Born at Caerleon Mon, March 3, 1863, Arthur Llewellyn Jones-Machen was educated at Hereford. *Eleusinia* (1881) was his first book, followed by *The Anatomy of Tobacco*, 1884, and *The Chronicle of Clemency*, 1888. Later works included two volumes of autobiography, *Far-Off Things*, 1922, and *Things Near and Far*, 1926, as well as much macabre fiction, the most noteworthy examples of which were *The Great God Pan*, 1894, and short stories in the mood of R. L. Stevenson's *New Arabian Nights*, these being eventually collected in *The House of Souls*, 1930. In *Hieroglyphics*, 1923, he outlined his artistic creed. With Benson's company 1900-02, he played Shakespearian roles. He later joined the staff of the *Evening News*, retiring from journalism after the First Great War. He died at Beaconsfield, Dec. 15, 1947.

Machete. Knife of Spanish origin, much employed by the native races of Central and S. America. It has a characteristic long, thick blade, and is used as a tool as well as a weapon. *Pron.* Mah-chay-tay.

Machiavelli OR MACCHIAVELLI, NICCOLÒ DI BERNARDO DEI (1469-1527). Italian author and statesman. Son of a jurist, and member of an old Tuscan family, he was born at Florence, May 3, 1469. His learning was acquired chiefly by private study. In 1498, four years after the expulsion of the Medici and the foundation of the Florentine republic, he became secretary to the Ten, a chancery combining the duties of war office and ministry for home affairs. He brought to his work an ardour inspired by admiration for old Rome. He was employed on several diplomatic missions, conceived an admiration for the unscrupulous but successful methods of Cesare Borgia, and held office until the Medici returned in 1512. He was then involved in the downfall of his patron, the Gonfalonier Soderini, and was cast into prison,

accused of complicity in an attempt to restore the republic, put to torture, but soon after set free.

Believing that some form of republican government might be built up under the Medici, he declared his readiness to serve them, but, except in slight matters, his assistance was not sought. He



Niccolò Machiavelli,
Italian author

From a painting by Santi di Tito

retired to his villa near San Casciano, seven miles from Florence, where he wrote *Il Principe* (*The Prince*) and his *Discorsi* (discourses on the first decade of Titus Livius). In 1520 he produced his *Arte della Guerra* (art of war), and was commissioned by Giulio de' Medici (later Pope Clement VII) to write his *Istorie Fiorentine* (Florentine stories). He wrote also several comedies, including *La Mandragola*, a picture of the men and society of his time, and perhaps the finest comedy of the Italian stage. When the Medici were once again banished from Florence, Machiavelli was disappointed in his hope of office, and died June 22, 1527, leaving four sons and a daughter by his wife, Marietta Corsini. He was buried at Santa Croce, where in 1787 a stately cenotaph was erected to his memory.

Machiavelli's fame rests upon *The Prince* and the *Discourses*, related books concerning respectively principalities and republics. His main theme, illustrated by references to the rulers of his own time, is the supremacy of the secular state. He regarded the state as the supreme end, and all means to preserve it as justified. Morality had nothing to do with the matter, and the ruler must be both lion and fox. The world he

regarded as always the same; man growing neither better nor worse.

For four centuries Machiavelli's name has been used as a term of reproach, largely because of misunderstanding. In Elizabethan literature alone hundreds of references connect him with the Evil One. Butler, in *Hudibras*, erroneously derived Old Nick from Niccoló. But Machiavelli did not scoff at private virtue; it was his intention merely to separate ethics from political science. The *Prince* was never published by the author, with the result that its text is debatable. But there is no division among critics as to the precision and clarity of its style, which has been compared with that of the clinical lecturer, or as to Machiavelli's mastery of the subtle irony of the literal statement. Several editions and translations exist. See *Italy: Literature; Sovereignty*.

Bibliography. Trans. of principal prose works, C. E. Detmold, 1891; *Life and Times*, P. Villari, 1877-82, popular ed. 1904; *Pioneer Humanists*, J. M. Robertson, 1907; *Life*, G. Prezzolini, Eng. trans. 1928; Machiavelli, J. H. Whitfield, 1947.

Machicolation (O.Fr. *macher*, to crush; *coulis*, groove). Term used in fortification. In medieval fortresses it was the provision of an overhanging parapet with holes through which molten lead, stones, etc., could be dropped upon the attacking forces. Such loopholes provided also protection from missiles aimed to drop on the defenders. The word is sometimes used for loopholes constructed in fortifications for downward fire, and also for ornamentation in imitation of the original machicolation. The machicoulis was a contrivance used in medieval times for casting stones down upon the enemy.

Machinability. The capacity of a material to withstand such mechanical finishing operations as bring it to desired standards of surface finish, size, and shape. No standard test is acceptable generally, because many variable factors must be measured. Usually the process which a material must stand are: (a) cutting with a shaped

cutter; (b) abrasion with hard particles of various sizes embedded in various kinds of matrices; (c) localised forming, with shaped formers or rolls, which causes the material to flow into the desired forms. See *Grinding*.

Machine-Gun. Automatic gun giving a continuous volume of fire by a single pressure on the trigger. It thus has a fire-power equivalent to that of a number of men armed with single-shot weapons.

The first attempts to devise automatic discharge of missiles in rapid succession from the same weapon were made long before the invention of fire-arms, and were inspired by the difficulty of breaking the ranks of massed pikemen, infantry's then defence against the cavalry charge. The ordinary missile weapon lacked range, was inaccurate, and was slow in delivery. Early in the 5th century B.C., Dionysius of Syracuse introduced the polybolos, a weapon resembling a cross-bow which fired a succession of arrows fed to it by force of gravity. At the battle of Hastings some of the English archers used bows designed to discharge more than one arrow at a time. Soon after the introduction of gunpowder in the 14th cent., the Italians introduced the orgue, a crude form of machine-gun. It consisted of ten iron tubes mounted side by side and fired by a single lock and quick match which ignited the charges of all the barrels in rapid succession. It was first used at the battle of Piccardina, 1467. A somewhat similar device, the ribaudequin, so-called from the laughter-like noise of its fire, consisted of twenty arquebuses connected to a combustion box common to all; it was used with devastating effect by the Venetians at the battle of Ravenna, 1512.

In 1718 James Puckle, a Londoner, patented a revolver-gun consisting of a single barrel having at the breech a revolving cylinder with nine chambers. Each chamber contained a bullet and charge of gunpowder and was aimed with the breech by turning a crank. When one cylinder or magazine had fired its nine chambers, it was replaced by another fully loaded and primed. The inventor stated that the shapes of the chambers and of the bullets could be varied, so that square bullets could be used against heathens and round bullets against Christians. Puckle's machine-gun was the first with a single barrel; it included

also elevating and traversing screws and a tripod mounting, features which became accepted parts of heavy machine guns. The weapon proved inefficient, and does not appear ever to have been used in action.

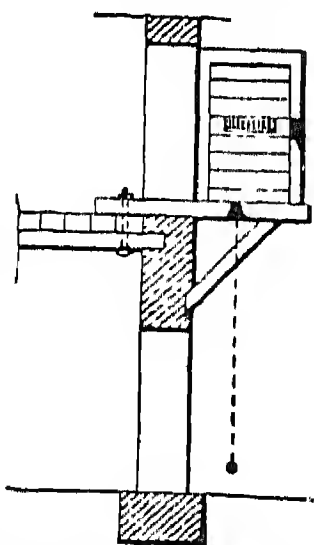
About the middle of the 18th cent. a French artillery officer designed a machine-gun having three rows of ten barrels, each barrel .44 ins. long with a bore of .75 in. At the breech of the gun was a plate having a chamber for each barrel, and in the rear of the chambers was a percussion box with which each chamber was connected. A hammer, falling by gravity, struck a percussion cap which ignited the powder in the combustion box, which in turn ignited the powder in the barrel chambers, so firing all 30 charges simultaneously. A specimen of this gun is preserved in the rotunda at Woolwich arsenal.

Early Automatic Weapons

In 1854 Sir John Lillo invented what was called an automatic rifle battery. It had twelve barrels in two rows and behind each barrel was a chambered cylinder similar to that of a revolver, half the cylinders being 10-chambered, half 20-chambered. Each chamber held a bullet, charge, and percussion cap, and the weapon was fired by turning a handle, which caused the cylinders to revolve and a series of hammers to fall, striking the percussion caps. In 1860 Dr. Joseph Requa, an American, introduced his rapid fire gun, consisting of 25 barrels laid flat on a platform. This weapon was used during the American Civil War, being mounted on a fort at Charleston, S. Carolina.

All these early machine guns proved impracticable owing to the problem of reloading the discharged barrels. The best that could be achieved was the rapid discharge of a number of barrels, after which fresh charges had to be rammed home in each barrel, so exposing the crew to enemy fire. Moreover, the weapons were inaccurate and too cumbersome for the firer to change target during discharge.

With the invention of the breech loader and the percussion cartridge, the latter containing missile, propellant, and percussion charge, the machine-gun became a practicable weapon. The first breech-loading machine-gun firing cartridge rounds was the mitrailleuse invented by a Belgian officer, Capt. Pafschamps, in 1851, and introduced into the French army



Machicolation. Sectional diagram of gallery built out of a window to permit of downward fire

1869, as the Montigny mitrailleuse. It consisted of 37 barrels assembled round a central axis and contained in a barrel like that of a field gun. It was loaded by a magazine in the form of an iron plate drilled with 37 holes, with a 13-mm. cartridge inverted in each hole corresponding with the position and number of the barrels. The gun was fired by the turning of a handle, one revolution discharging all the rounds in the magazine. The maximum rate of fire was 12 magazines a minute, *i.e.* 444 rounds. Mitrailleuse guns were first in action at the battle of Saarbrücken, opening engagement of the Franco-Prussian war, Aug. 2, 1870, but owing to faulty tactical use had little effect on the outcome of the engagement. At the battle of Gravelot later in the same month, the mitrailleuses were better sited and inflicted heavy losses on the German infantry.

As a reply to the mitrailleuse, the Germans developed the field machine-gun, which had 24 barrels mounted in four parallel rows of six and fired 300 rounds a minute to an effective range of 1,000 yds. But the loading mechanism was too complicated, and, like those of the mitrailleuse, the barrels became overheated and warped in their frames after only a short period of fire.

The Gatling Gun

The first really practicable machine-gun was invented by Dr. Gatling (*q.v.*), of Chicago, in 1862. This gun consisted of 6-10 rifle barrels fixed at equal distances round a central axis and mounted on a field-gun carriage. Each barrel was complete with bolt, firing pin, extractor, and ejector. Placed above the barrels was a gravity drum containing the rounds to be fired. The gun was not fully automatic since a crank had to be turned, causing the barrels to revolve round the central axis; but the actions of inserting a round, closing the breech, releasing the sear of the firing pin, firing, opening the breech, extracting and ejecting the empty case, and inserting a new round were performed automatically during the revolution of the barrels. As the uppermost barrel passed under the drum a round dropped into its breech; as it passed to the next position the cartridge was pushed home and fired on reaching the lowest position below the drum. When the barrel passed up on the left side of the central axis the empty case

was extracted from the breech, and as it moved farther up was ejected.

First used in the American Civil War, the Gatling gun fired 350 rounds per min. It was introduced into the British and other European armies, but suffered from two serious defects: the movement of the barrels, caused by the turning of the crank, rendered it inaccurate, while the cranking itself had to be carefully timed: if the handle were revolved too fast, the rounds dropping from the drum missed the centre of the breech and jammed. The Gatling was first used by the British in the Zulu war of 1879.

Other multiple-barrelled machine-guns were the Nordenfeldt and Gardner. The Nordenfeldt had from 3 to 6 rifle barrels mounted in a single row and was gravity fed from ammunition chutes. The Gardner gun was somewhat similar, but an improved loading action made fewer barrels necessary and increased firing rate to 357 rounds a min.

All multiple-barrelled machine-guns suffered from excessive recoil and required a heavy mounting; consequently they were nearly as cumbersome in the field as artillery pieces. They were usually sited with the field artillery, but were much more vulnerable than field guns. Moreover, none of these weapons was truly automatic; that is, a considerable amount of hand-work was required in loading, while manual work was essential to turning the crank or other device upon which fire depended. On the other hand, they proved useful weapons on warships as secondary armament for beating off torpedo-boat attacks. During the period 1880-1900 most British warships had batteries of Gatlings, Gardners, and Nordenfeldts ranging from .303 to .45 in. in calibre.

Hiram Maxim's Invention

The first true machine-gun, a single-barrel weapon requiring merely the pressing of a trigger to eject a stream of bullets, was invented by Hiram Maxim in 1885. In the Maxim gun, the force of recoil generated by a portion of the explosion when the initial round is fired impinges on a baffle fitted to the barrel, forcing it to the rear; it is then returned to the forward position by a heavy coil spring. The breech-block is connected to the barrel by a series of levers, so that by means of the reciprocating motion it ejects the spent case, cocks the hammer,

feeds in a new round, and fires it. The fabric or clip belt, holding 250 rounds, is automatically fed into the side of the breech block, each recoil of the gun pulling the belt through for a distance of one round. As finally developed for firing .303 ammunition, the Maxim fired 600 rounds per min. to an effective range of 2,500 yds. It weighed 60 lb. and its tripod 48 lb.

Developments of the Maxim

Maxims were adopted by the British army in 1889 and first used in the Matabele war of 1893. The gun was also used with devastating effect against the charges of Ghazis at the Malakand pass in the Chitral expedition of 1895, and by Kitchener in the Sudan campaign of 1896. A later development of the Maxim, the pom-pom, which had a calibre of 1.45 in. and fired steel shells weighing 1 lb., was used by the Boers in the S. African war. Neither the .303 Maxim nor the pom-pom proved particularly successful in the Boer war, chiefly owing to the fact that both types were mounted on heavy wheeled carriages and used tactically as field artillery. Mounted on tripods and used as an infantry weapon, Maxims were used by the Russians in the Russo-Japanese war, 1904-05, and did heavy execution until the Japanese infantry was equipped with the Hotchkiss (*q.v.*) which, gas-operated and air-cooled, had originally been designed for the French colonial army in N. Africa.

As the result of the lessons learned from this campaign in Manchuria, the Germans equipped their infantry with the Maxim and retained it as their principal machine-gun throughout the First Great War. At the outbreak of that war every British infantry battalion was equipped with two tripod-mounted Maxims, every cavalry unit had two Vickers machine-guns. The Vickers had been used on a small scale during the S. African war as a cavalry weapon, being lighter than the Maxim. It weighs 36 lb. without its mounting and fires 600 rounds a min. to an extreme range of 2,900 yds. Eventually every British infantry company was provided with two Vickers or Maxim guns. It was found, however, that the ordinary machine-gun, although a deadly weapon in defence and for laying a barrage to cover attacking infantry, was too heavy when it had to be carried forward by advancing troops. Accordingly, a number

of light machine-guns were developed, of which the most successful was the Lewis, adopted by the British army late in 1915. The Lewis gun weighs 26 lb. and is worked automatically by the pressure of the gas, resulting from the explosion of the charge, assisted by a return spring. When the trigger is pressed, a backward and forward movement, with the ignition of a cartridge at the end of each forward movement, continues until the magazine is empty. The gunner may fire either single or continuous shots up to the full capacity of the pan-shaped magazine, which holds either 47 or 97 rounds. The gun is air-cooled and can be fired from the shoulder in the prone position or from the hip when moving forward. The barrel is provided with a small, permanent bipod.

With the development of air warfare the machine-gun proved itself an ideal weapon both for mounting on aircraft (see Air Fighting: Armament) and as a ground defence against low-level air attack. The first airborne machine-guns were single or twin Lewis guns fitted to Scarfe rings and mounted on the Martinsyde Scout late in 1915. Thereafter the machine-gun became the fighter aircraft's offensive and defensive weapon, and at the outbreak of the Second Great War the number carried by a single aircraft had increased to the eight Browning guns mounted in the wings of the Spitfire. Machine-guns also proved the ideal armament for armoured vehicles, and although these were eventually mounted with shell-firing guns equivalent in calibre to field artillery pieces, the machine-gun continued to be fitted to them as secondary armament.

Between the First and Second Great Wars the machine-gun underwent further changes, the general tendency, as far as the infantry weapon was concerned,

being towards lightness; a demand necessitated by the increased mobility of infantry. One of the most notable light machine-guns for infantry work was the Bren, with which a proportion of British infantry was equipped at the outbreak of the Second Great War, and which eventually became the standard British infantry machine-gun. Modified and lightened versions of the Vickers and Browning were also extensively used. The principal German machine-gun of the Second Great War was the M-G.15, which weighed 26 lb. and fired standard 7.92 mm. small arms ammunition at the rate of 900 rounds a min., 75 rounds being contained in the double-drum magazine. The standard Italian machine-gun was the Brega, which weighed 25½ lb. and fired .256 ammunition at 1,000 rounds a min. Both the M-G.15 and the Brega were recoil operated.

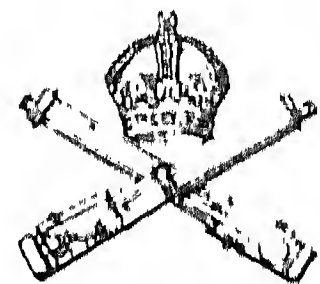
All types of machine-guns were adapted for anti-aircraft work during the Second Great War. In most cases they were mounted in pairs or fours, pressure on a single trigger firing all guns simultaneously. In the case of water-cooled guns, the water jackets were removed for A.A. work, cooling being by air flow over the barrel. Even in the case of the original water-cooled infantry machine-gun, water-cooling is frequently dispensed with: when the barrel becomes overheated it is replaced by a spare. From the machine-gun firing ordinary small-arms ammunition was developed the heavy machine-gun (or cannon) firing shells.

One machine-gun can deliver a volume of fire equal to that of 30 riflemen, while occupying 1/15th of the space needed for 30 men, and requiring only 1/15th of that number, or less, to handle it. As a defensive weapon, the machine-gun is easily concealed, and after

it opens fire is difficult to detect, particularly since the introduction of smokeless powder and the fitting of condensers to absorb the steam from water cooling systems. Provided it has been sited in a strong emplacement, it is difficult to destroy by artillery or air bombardment and, manned by a resolute crew, takes heavy toll of the advancing infantry. Even in the Second Great War well-protected and carefully sited machine-gun posts were capable of delaying armour. The essentials of the successful defensive use of machine-guns are: abundant supply of ammunition; concealment; reservation of fire until a target of sufficient importance presents itself; and accurate knowledge of all ranges in the area operated across. As an offensive weapon, the machine gun is most effectively used to give flanking fire to advancing infantry and to deliver overhead fire to drive the defence to cover between the forward infantry rushes. In both offence and defence, machine gun fire is most effective in short bursts rather than as continuous fire. See Arquebus; Browning Gun; Infantry; Ordnance; Tactics, etc.

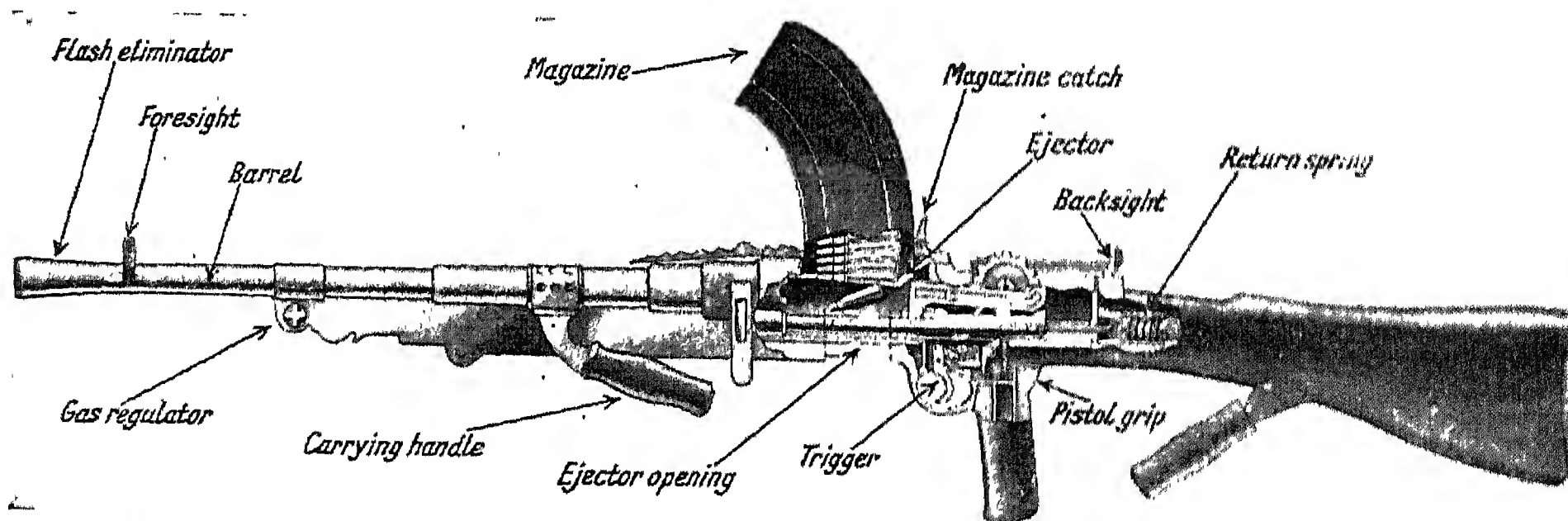
David Le Roi

Machine Gun Corps. Former unit of the British army. Raised in Oct., 1915, in view of the in-



Machine Gun Corps badge

creasing tactical importance of the machine-gun in warfare, the corps amalgamated into a single unit the machine-gun companies then attached to brigades. It was divided into infantry, cavalry, heavy, and motor branches. With the introduction of machine-guns into the ordinary infantry platoon (1921), the corps was disbanded. A bronze statue of David designed by Derwent



Machine-Gun. Diagram of Bren machine-gun, British light automatic weapon of the Second Great War

Wood was unveiled at Hyde Park Corner on May 10, 1925, as a memorial to the corps, with the inscribed quotation: Saul hath slain his thousands, and David his ten thousands.

Machine Tools. Metalworking or woodworking tools driven by mechanical power. Examples are: (metalworking) lathes, planers, milling machines, drill presses; (woodworking) circular saws, band saws, planing machines, moulding machines, mortising machines. It is computed that British industries use machine tools worth about £30,000,000 annually. Light machine tools include some which are really mechanised hand tools, such as electric or pneumatic drills, nut-runners, or small circular saws. These the workman guides by hand, the gain over hand tools being in speed, accuracy, and absence of fatigue. Bench tools include drill presses, punches, die presses, etc., in some of which the operation may be entirely automatic, or semi-automatic.

Lathes (*q.v.*) range from a tiny one used by watchmakers to a gigantic machine which needs an entire shop for its accommodation and may be more than 60 ft. in length. This last would be used for machining heavy forgings such as engine crankshafts. Planing machines have a similar range.

Mach Number. In aeronautics, the ratio of aircraft speed to the speed of sound under the same atmospheric conditions. It is named after the Austrian physicist Ernst Mach (*q.v.*), and is expressed as a decimal. The instrument called a machmeter was evolved to register the Mach number.

Machpelah. Locality in Hebron, ancient Palestine (modern Jordan). Here in a double cave on the hillside is the traditional burial place of Abraham and other Jewish patriarchs (Gen. 23). Above the cave rises the Mahomedan mosque of El Khulil (the friend, *i.e.* Abraham). The summit of the hill commands a fine view of the Vale of Mamre.

Machynlleth. Urban dist. and market town of Montgomeryshire, Wales. It stands on the Dovey, 18 m. by rly. N.E. of Aberystwyth, and is a quiet holiday resort. Here in 1402 Owen Glendower declared himself prince of Wales and held a parliament. Until 1894 the place was a borough, and it formerly made woollen goods. Market day Wed. Pop. (1951) 1,875.

M'Ilwraith, Sir Thomas (1835-1900). Australian politician. He was born at Ayr, Scotland, edu-

cated at Glasgow university, and became a civil engineer on the government rlys. in Victoria in 1854. In 1868 he entered the legislative assembly of Queensland and was minister of public works, 1874-79, and premier, 1879-83. In 1888 he formulated a programme for a national party and once more assumed the premiership. A long dispute with the governor regarding the prerogative of mercy was settled in favour of M'Ilwraith. In 1890 he joined Griffith in defeating the government and became treasurer. He was again premier in 1893, after which he retired. Knighted in 1882, he died in London, July 17, 1900.

Macintosh, Charles (1766-1843). British chemist and inventor. Born Dec. 29, 1766, he early took an interest in science, and at 20 entered a sal ammoniac manufactory. In 1786 he took up the manufacture of sugar of lead, in 1797 he opened the first Scottish alum works, and two years later was the inventor, with Charles Tennant, of bleaching powder, out of which a large fortune was made. Macintosh invented a process of conversion, by the use of carbon gases, of malleable iron to steel, which was much quicker than the concentration process then in use. He worked out the hot blast process in conjunction with Neilson. But despite his important researches in chemistry, Macintosh's name is inevitably linked with the invention of waterproof fabrics, for which he took out a patent in 1823. Elected F.R.S. in that year, he died July 25, 1843.

MacIvor, Flora. Character in Scott's novel *Waverley*, devoted, like her brother, Fergus, to the Jacobite cause. A friend of Rose Bradwardine, she refuses the suit of Edward Waverley, and after her brother's execution retires to a convent in Paris.

Mack, Karl (1752-1828). Austrian soldier, in full Freiherr Karl Mack von Leiberich. Born Aug. 25, 1752, he entered the army in 1770, and served in the short war of the Bavarian succession and against the Turks, holding a position on the staff. In and after 1792 he fought against France, chiefly in the Netherlands, and rose to be field-marshal. In 1798 he was put in command of the troops of the king of Naples, but he could do nothing with them and was made prisoner by the French, soon escaping. Having been appointed quartermaster-general, he led the army assembled in Bavaria to oppose the French. The campaign

was badly conducted, and ended in the surrender of Mack and a large force at Ulm, Oct. 20, 1805. He died Oct. 22, 1828. See *Ulm Campaign of*.

Mackail, Denis George (b. 1892). British novelist. Born June 3, 1892, son of J. W. Mackail (*v.i.*),

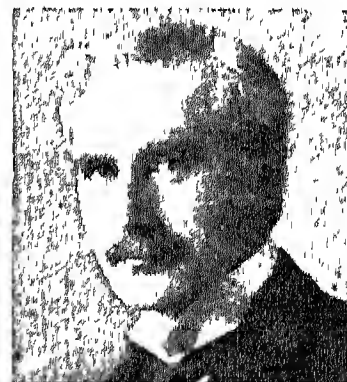
he was educated at St. Paul's and Balliol College, Oxford. His first novel, *What Next?* 1920, was succeeded by a number of light, entertaining publi-



Denis Mackail,
British novelist

cations, notable for their humour and adroit characterisation, *e.g.* *Greenery Street*, 1925; *The Fortunes of Hugo*, 1926; *The Flower Show*, 1927; *Summer Leaves*, 1934; *Back Again*, 1936; *Life with Topsy*, 1942; *Our Hero*, 1946.

Mackail, John William (1859-1945). A British scholar. From Balliol College, Oxford, he entered the board of education. A brilliant classical scholar, he was professor of poetry at Oxford, 1906-11; president of the Classical Association, 1922-23; and of the British Academy, 1932; also professor of ancient literature in the Royal Academy. His books include *Latin Literature*, 1895, an outstanding critical manual; the standard *Life of William Morris*, 1899; a notable verse translation of Homer's *Odyssey*, 1903-10; *Classical Studies*, 1925; *Studies of English Poets*, 1926; *The Approach to Shakespeare*, 1930; *The Sayings of Christ*, 1938. In 1935 he received the O.M. and he died Dec. 13, 1945.



J. W. Mackail,
British scholar
Elliott & Fry

Mackay. Port of Queensland, Australia. It stands on the Pioneer river, 598 m. N.N.W. of Brisbane, to which it is linked by the main rly. Its harbour facilities have been improved at a cost of £250,000; it exports sugar, timber, coffee, copper, gold. Pop. (1954) 14,764.

Mackay, Alexander Murdoch (1849-90). A British missionary. Born at Rhynie, Aberdeenshire, Oct. 13, 1849, and educated as an engineer, he was employed with engineering firms in and near

Berlin. In 1876 he offered his services to the Church Missionary Society, who sent him to work as a lay missionary and mechanic in Uganda, where he remained from 1878 till his death, Feb. 8, 1890.

MacKay, CHARLES (1814-89). A British journalist and song writer. Born at Perth, March 27, 1814, he



was educated at the old Caledonian Asylum, Hatton Garden, and at Brussels. Assistant sub-editor of the *Morning Chronicle*, 1835-44, and editor of the *Glasgow Argus*, 1844-47, he was editor of the *Illustrated London News*, 1852-59, and special correspondent of *The Times* in New York 1862-65. He died in London, Dec. 24, 1889.

His fame rests chiefly on songs, especially *Cheer, Boys, Cheer*, of which 400,000 copies were circulated in his lifetime; *There's a Good Time Coming*, and *Tubal Cain*. His songs appeared in collected form in 1859 and 1868. He edited collections of *Jacobite and Cavalier ballads*; compiled *One Thousand and One Gems of English Poetry*, 1867, and *One Thousand and One Gems of English Prose*, 1872; and wrote a *History of the Mormons*, 5th ed. 1857. He also interested himself in Celtic lore and language. Marie Corelli (*q.v.*) was his illegitimate daughter.

Mackay, HUGH (1640-92). A Scottish soldier. The son of Hugh Mackay of Scourie, Sutherland, he entered the English army in 1660. He served in France, his regiment being one of those sent to assist Louis XIV in his wars, and was afterwards in the service of Holland. He refused to return when James II asked for his aid, but was one of the chief generals in the force brought to England by William of Orange. Sent as commander-in-chief to Scotland, he built Fort William and, in spite of his defeat at Killiecrankie, July 27, 1689, reduced the Highlanders to some kind of order. Afterwards he served against the Jacobites in Ireland, being largely responsible for the victory at Aughrim. Mackay was killed at Steinkirk when leading his division in the hottest part of the battle, July 24 (o.s.), 1692.

Mackay, JOHN WILLIAM (1831-1902). American financier. Born in Dublin, Nov. 28, 1831, he went

to New York as a child. Proceeding to California in 1851, he amassed money by mining, and discovered the great Bonanza vein in the Comstock lode, Nevada. He part-founded the Bank of Nevada in San Francisco. In competition with the Western Union Telegraph company he organized the Commercial Cable co. in 1884, cheapening the cost of cabling to Europe, and forming later the Postal Telegraph company. He died in London, July 20, 1902.

Mackaye, PERCY (b. 1875). American dramatist and poet. Born, New York, March 16, 1875, he was educated at Harvard and Leipzig. After the production (1903) of his comedy, *The Canterbury Pilgrims*, he devoted himself to writing and to lecturing at universities on the drama. His publications include 13 volumes of poetry; many plays, including *Jeanne d'Arc*, a tragedy, 1906; *Anti-Matrimony*, a satirical piece, 1910; *A Thousand Years Ago*, 1914; ten volumes of masques, and four of grand opera libretti. He became president of the Pan-American Poets' League of N. America, and received a national testimonial on his 70th birthday.

McKeesport. Industrial city of Pennsylvania, U.S.A., in Allegheny co., it stands at the junction of the Youghiogheny and Monongahela rivers, 15 m. S.E. of Pittsburgh, and is served by rlys. and airports. It is in the Pittsburgh iron and steel district and a retail market for the Pennsylvanian and West Virginian bituminous coal and gas fields. "Tube City" produces steel tubes, pipes, sheet steel, and canned meat. Pop. (1950) 51,502.

McKell, WILLIAM JOHN (b. 1891). An Australian politician. Born at Pambula, N.S.W., Sept. 26, 1891, he was educated at a state school in Sydney before serving his apprenticeship as a boilermaker and becoming financial secretary of the Boilermakers' Union. At 25 he was elected to the N.S.W. legislative assembly, and in 1920 was minister of justice for the first of several terms. He was called to the bar in 1925, and carried out financial missions to London and New York in 1927. On May 16, 1941, he became Socialist premier and treasurer of his state. In 1947 he was named governor-general of the Commonwealth in succession to the duke of Gloucester.

McKenna, MARTHE (b. 1892). Belgian nurse, born Marthe Cnockaert, who acted as British secret service agent in the First Great War. While serving, 1915-17, in

a German military hospital at Roulers, she reported German troop movements, helped British prisoners to escape, and effected destruction of German ammunition dumps, etc. She was awarded the French and Belgian Legions d'Honneur, and was mentioned in Haig's despatches. For her nursing work she received the German iron cross. In 1932 she published the story of her adventures, *I Was a Spy*, later made into a British film. She wrote several other books on spies and spying.

McKenna, REGINALD (1863-1943). A British politician and banker. Born July 6, 1863, son of a London merchant, he



Reginald McKenna,
British politician
Russell

was educated at King's College, London, and Trinity Hall, Cambridge, where he rowed in the university eight. He was called to the bar in 1887, but forsook the law in 1895 when he became Liberal M.P. for N. Monmouthshire. He was financial secretary to the Treasury, 1905-07, and then joined the cabinet as president of the board of Education. First lord of the Admiralty in 1908, he successfully supported its demand for more dreadnoughts.

He was home secretary from 1911 until made chancellor of the exchequer in Asquith's war time coalition ministry of 1915. Though normally a stern free-trader, he increased the duties on tea, sugar, coffee, and other imported commodities, taxed entertainments and matches, and imposed the so-called McKenna duties on imported motor cars, watches, etc. He left office with Asquith in Dec., 1916, and in the 1918 election lost his seat. From 1919 McKenna was chairman of the London Joint City and Midland (now Midland) Bank, and in 1928 published *Post War Banking Policy*. This last Gladstonian Liberal died Sept. 6, 1943.

Mackennal, SIR BERTRAM (1863-1931). Australian sculptor. Born in Melbourne, he was a son of a Scottish sculptor who had emigrated. Coming to England in 1883, he entered the R.A. schools, but soon went to Paris to study. During 1889-91 he was engaged on the decoration of the government house at Melbourne. His *Circé*, 1893, exhibited at the Salon and the R.A., won public recognition. Among later works were statues of Queen Victoria for Lahore,

Blackburn, and Australia; a portrait bust of Sarah Bernhardt; the Earth and the Elements, and Diana, two imaginative pieces bought by the Chantrey bequest for the Tate Gallery; coinage designs for George V (the sculptor's initials being faintly discernible at the base of the king's neck); the national memorial to Gainsborough; the house of commons war memorial; and memorials to Edward VII in London, Calcutta, Melbourne, and Adelaide. He was knighted in 1921, made R.A. next year, and died Oct. 10, 1931.

Mackensen, August von (1849-1945). A German soldier. The son of a land agent in Saxony, he



August von Mackensen, German soldier

was born Dec. 6, 1849. Educated at the Torgau gymnasium and the university of Halle, he entered the army as a private in 1869. By 1898 he was A.D.C. to the Kaiser

and by 1908 was general of cavalry and commander of the 17th army corps. When the First Great War broke out, he was prominent in the second attack on Warsaw.

In reality generalissimo of all the Austro-German forces in the S., Mackensen carried out the great drive in 1915 against the Russians which began with the Dunajetz battles and ended in the reconquest of nearly all Galicia. He then cooperated in the campaign that compelled the evacuation of Warsaw by the Russians. Made a F.M., he overran Serbia, and led the army that subjugated Rumania by Jan., 1917. Remaining there until the armistice of 1918, he was in effect dictator. He retired in 1920, but lived until Nov. 8, 1945.

His third son, Everhard von Mackensen (b. Sept. 24, 1889), served on the general staff in the First Great War, and as a corps and army commander (col.-gen.) in the Second. Captured in Italy, he was tried in 1946 by a British tribunal as a war criminal and, with Lt.-Gen. Maeltzer, found guilty of being concerned in the murder of 335 Italians (see Ardeatine Caves). The sentence, death by shooting, was commuted to life imprisonment 1947; he was released 1952.

Mackenzie. River of Canada. It has its source in the headwaters of the Athabaska river, issuing from the Yellowhead and Athabaska passes of the Rocky

Mountains. As the Athabaska it enters Athabaska Lake, which it leaves as the Slave river, and after 20 m. is joined by its great tributary, the Peace river. Entering the Great Slave Lake, it emerges thence as the Mackenzie, and is navigable onwards to its outlet, through a wide delta by Fort Macpherson, at Mackenzie Bay, a distance of 1,120 m. Its direction is almost continuously N. Never less than 2 m., in some places it attains a width of 3 to 4 m. The lower river is frozen in winter from Nov. to May; as the ice melts first in the upper waters the lower course is flooded in the early summer. The total length is 2,500 m., and the basin area 682,000 sq. m. Other tributaries are the Liard, Great Bear, and Peel. Fish abound in the Mackenzie, and its valley and banks contain coal-seams, salt deposits, petroleum, natural gas, and tar-springs. See Athabaska; Peace; Slave.

Mackenzie. District of the North-West Territories, Canada. Named after the explorer Sir Alexander Mackenzie, it was part of the territory purchased by the Dominion from the Hudson's Bay Co. It lies between the Arctic Ocean on the N. and Alberta and Saskatchewan on the S. To the W. is Yukon, to the E., Keewatin. Mackenzie was made, 1920, a district of the North-West Territories. Area 527,490 sq. m.

Mackenzie, Sir ALEXANDER (c. 1755-1820). British explorer, born at Inverness. He entered service



Sir A. Mackenzie, British explorer after Lawrence

of the North-West Fur Company of Canada in 1779 and speedily gained a knowledge of topography. In 1789 he was dispatched from Chipewyan, Lake Athabaska, on an expedition to explore the unknown N.W., in the course of which he discovered the outlet of the river which bears his name, and penetrated to the Arctic Sea. In 1792 he set out to reach the Pacific, and after nine months of exceptional hardship succeeded and returned to Chipewyan. In 1801 he published an account of his explorations. He was knighted in 1802 and died near Dunkeld, Perthshire, March 11, 1820.

Mackenzie, ALEXANDER (1822-92). Canadian politician. Born near Dunkeld, Jan. 28, 1822, he

emigrated to Canada when 20. At first he worked as a mason, but later set up for himself as a builder at Sarnia, Ont., and became interested in local politics. In 1861 he entered the legislature of Canada as a Liberal. In 1867 he was sent to the Dominion house of commons, where he led the opposition, being simultaneously treasurer of his own province. When Macdonald's government was defeated at the general election of 1873, Mackenzie became the Dominion's second premier, but in 1878 was driven from power by the advocates of a policy of protection. He resigned the party leadership in 1878, but remained in the house until his death at Toronto, April 17, 1892.

Mackenzie, Sir ALEXANDER CAMPBELL (1847-1935). British musician. Born in Edinburgh,



A.C. Mackenzie
Russell

Aug. 22, 1847, he was the most distinguished of a family of musicians extending over four generations. He studied the violin in Germany, but in 1862 returned to the Royal

Academy of Music, soon gaining the king's scholarship. After living some years in Florence, he was appointed principal of the R.A.M. in 1888 and retired in 1922. For several years he conducted the concerts of the Philharmonic Society in London. He was knighted in 1895, and died April 28, 1935. His most successful works are those national in character like *The Cottar's Saturday Night*, Scottish rhapsodies, Scottish piano concerto, and the overture *Britannia*.

Mackenzie, Sir (EDWARD MONTAGUE) COMPTON (b. 1883). British writer. Son of Edward, and brother of Fay, Compton (q.v.), he was born at W. Hartlepool, Jan. 17, 1883, and educated at St. Paul's school and Magdalen College, Oxford. He made his reputation as a



Sir Compton Mackenzie, British writer

novelist with *Carnival*, 1912 (dramatised the same year), and achieved popular success with *Sinister Street*, 1913-14; *Guy and*

Pauline, 1915; Sylvia Scarlett, 1918, and a sequel, Sylvia and Michael, 1919. During the First Great War he was military control officer at Athens, 1916, and director of the Aegean intelligence service, 1917. His experiences in Greece inspired *Extremes Meet*, 1928; *Gallipoli Memories*, 1929; *Athenian Memories*, 1931; and *Greek Memories*, 1932 (withdrawn after prosecution under the Official Secrets Act, but reissued 1940). Later novels included *Extraordinary Women*, 1928; *The Darkening Green*, 1934; *The Four Winds of Love: The East Wind*, 1937; *The South Wind*, 1937; *The West Wind*, 1940; *West to North*, 1940; *The North Wind*, 2 vols., 1944, 1945; *The Vital Flame*, 1946; *Whisky Galore*, 1947 (filmed 1950, Mackenzie playing the ship's captain). Vol. 1 of *Eastern Epic* appeared in 1951.

Rector of Glasgow university, 1931-34, literary critic to the *Daily Mail*, 1931-35, joint editor with Christopher Stone of *The Gramophone* from 1923, he was knighted 1952. A lover of islands, he lived on Capri, Herm and then Jethou (Channel Is.), and Barra. He moved to the home counties, 1947, to Edinburgh, 1953.

Mackenzie, Sir George (1636-91). A Scottish lawyer. Born at Dundee, he became king's advocate 1677. He ruthlessly pursued the Covenanters, applying the law relentlessly and ingeniously, boasting that he never lost a case for the king. But although so harsh in the discharge of his duties that he became known as Bloody Mackenzie, he observed the strictest legal formality. In his *Vindication* he defended torture as a means of obtaining evidence; and he used it with savage thoroughness. He inaugurated the period of persecution known in Scotland as the Killing Time. He died at Westminster, May 8, 1691, and was buried in Greyfriars churchyard, Edinburgh. *Consult* Sir George Mackenzie, King's Advocate, his *Life and Times*, A. Lang, 1909.

Mackenzie, Henry (1745-1831). A Scottish writer. Born in Edinburgh, and educated there, he first took up the law as a profession. His chief interest, however, was in literature, and during his long

life he was intimate with all the literary celebrities of his time. The *Man of Feeling*, 1771, written under

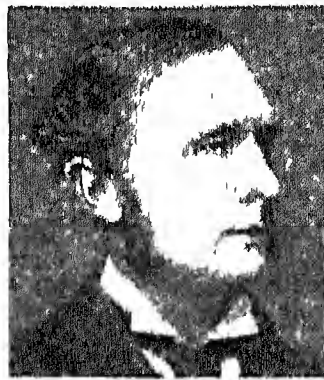


Henry Mackenzie,
Scottish writer

the influence of Sterne, enjoyed great vogue in its time. It furnished the nickname by which its author has ever since been known. Mackenzie, who was one of the first to recognize the genius of Burns, died Jan. 14, 1831.

Mackenzie, Sir James (1853-1925). British physician. Educated at Edinburgh university, and Vienna, he was in practice at Burnley from 1879 till 1907. In 1907 he settled in London as a consulting physician, and made a European reputation by his work and writings. In 1915 he was knighted and elected F.R.S. His writings include *The Study of the Pulse*, 1902; *Diseases of the Heart*, 1907; *The Future of Medicine*, 1919. He died Jan. 26, 1925. *Consult* Life, R. McNair Wilson, 1926.

Mackenzie, Sir Morell (1837-92). British surgeon. Born at Leytonstone, Essex, July 7, 1837, he took his M.D. degree at the London University, 1862, and winning the Jacksonian prize of the Royal College of Surgeons in 1863, with an essay *On the Morbid Anatomic Pathology*



of the Diseases of the Larynx, devoted the rest of his professional life to that study. He helped to found the hospital for diseases of the throat in King Street, Golden Square. In 1887 his diagnosis of the illness of the German crown prince, later Emperor Frederick III (q.v.), roused international controversy. Mackenzie wrote *Frederick the Noble*, 1888. He was knighted in 1887. A pioneer of the use of the laryngoscope in England, his most important work is *Manual of Diseases of the Throat and Nose*, 2 vols., 1880-84. He died Feb. 3, 1892. *Consult* Lives, H. R. Haweis, 1893; R. S. Stevenson, 1946.

Mackenzie, Samuel (1785-1847). British painter. Born Dec. 28, 1785, he worked as a herd-boy and as a superintendent of stonemasons in the N. of Scotland. At the age of 25, when he was em-

ployed by a marble cutter in Edinburgh, he came under the influence of Raeburn, and studied portrait-painting in his studio. The dukes of Gordon and Roxburghe commissioned a number of works from him, and Lord Brougham was among his sitters. He was one of the original members of the Scottish Academy, and exhibited regularly from 1829 to 1846, showing mainly portraits. A man of wide culture, he died in Edinburgh, Jan. 23, 1847.

Mackenzie, Sir Thomas (1854-1930). Scottish born New Zealand statesman. A native of Edinburgh, he was educated at Otago, N.Z. He entered the legislature in 1887, and held various government posts, being prime minister in 1912. Later he was high commissioner in London, retiring in 1920. He was knighted in 1916, represented his country at the peace conference, 1919, and in 1921 joined the New Zealand legislative council. He died Feb. 14, 1930.

Mackenzie, William (1791-1868). British surgeon. Born April 29, 1791, the son of a muslin manufacturer, he was educated at Glasgow grammar school and university, and studied medicine in Glasgow, London, and on the continent. He specialised in ophthalmic surgery, was one of the founders of the Glasgow eye infirmary, 1821, and in 1843 was among the surgeons who received the newly instituted fellowship of the Royal College of Surgeons of England *honoris causa*. In 1838 he was appointed surgeon-oculist to the queen in Scotland. His *Practical Treatise on the Diseases of the Eye*, 1830, was the standard text book until the invention of the ophthalmoscope in 1851, revolutionised the diagnosis and treatment of intraocular disease. He wrote several other treatises on the surgery of the eye. He died at Glasgow, July 30, 1868.

Mackenzie, William Lyon (1795-1861). Scottish born Canadian politician. Born near Dundee, March 12, 1795, he emigrated to Canada in 1820. In 1824 he started a paper, *The Colonial Advocate*, in order to focus the discontent felt in Upper Canada at the arbitrary acts of a small controlling clique.

Meanwhile, in 1828, Mackenzie had been elected to the legislature,



William L. Mackenzie,
Canadian politician

but he was expelled and, in spite of repeated re-elections, was not allowed to sit until 1834, when his party secured a majority in the house. Defeated in 1836, Mackenzie began to advocate republican doctrines, and spoke of securing his ends by force, founding for this purpose a new paper, *The Constitution*. He was soon in touch with the rebels in Lower Canada, and in Nov., 1837, he set up a provisional government. Collecting a force, he marched towards Toronto, but this rising was soon crushed, and he fled to the U.S.A. He was imprisoned briefly in 1839 for a breach of U.S. neutrality laws, then supported himself in the U.S.A. by journalism until in 1849 he was allowed to return to Canada. In 1851 he re-entered the legislature but resigned in 1858. He died at Toronto, Aug. 29, 1861. *Consult* Life and Times, C. Lindsey, 1862, abridged ed. 1909.

Mackerel. Fish of the family Scombridae, which, including the tunny, are all distinguished by their rounded bodies, very small scales, and the form of the dorsal fins. They are found in most parts of the world, three species occurring in Europe, including the common mackerel (*Scomber scombrus*). It varies in length from



Mackerel. Specimen of the fish which forms a staple article of food

14-18 ins. and is readily recognized by its bluish-green back, barred with black, and its silvery under-side. Its range extends from Norway to the Canaries and includes the Mediterranean.

Around the British coasts the mackerel migrates in a remarkable manner. In winter it is found in the Atlantic at some distance from shore; but about May it approaches the land in large schools, and is abundant off the Cornish coast until July. It reappears in Sept. for about a month, but is virtually absent from Nov. till the following spring. Off the E. coast of England the schools appear in May-June, and again in Sept.-Oct. It is believed that the spring visit is for the purpose of spawning, and the autumn one for pursuing swarms of fry.

The food of the mackerel in spring consists mainly of minute crustaceans, but in autumn of young sprats, pilchards, and sand eels. Spawning takes place in the

spring and early summer, the female depositing from 300,000 to 650,000 eggs, which float at the surface of the sea. These hatch in about a week, according to the temperature of the water; and it is believed that the fish become adult at about three years. Mackerel fishery is conducted in seine and drift nets, and the catch is often enormous.

Mackerel Sky. Name popularly applied to a sheet of high cloud consisting of small globular masses or white flakes arranged in patterns. In weather lore a mackerel sky is associated with changeable weather, but it has really little significance as an aid to forecasting.

Mackinac. Island and city of Michigan, U.S.A., in Mackinac co. The city, which is c. 250 m. N.W. of Detroit, stands on the N.E. shore of Mackinac Island, and was chartered as a city in 1900. Pop. (1950) 1,014.

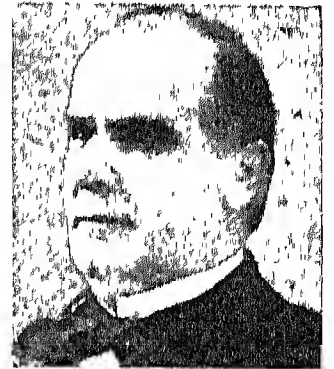
The island, 3 m. long and 2 m. wide, lies at the N.W. end of Lake Huron at the entrance to the Straits of Mackinac, a navigable channel 4 m. wide connecting Lakes Huron and Michigan, and separating the upper and lower peninsulas of Michigan state. Formed of rock, free from swamps, and naturally beautiful, the island is a popular summer resort; 95 p.c. of it is a state park. The principal Great Lakes steamers serve it. No motor cars are permitted on the island. *Pron.* mack-in-aw.

A British garrison occupied Fort Mackinac on the mainland in 1761. The fort was removed to the island in 1780-81, becoming the defence stronghold of the U.S. North-West Territory. The British captured it in 1812, withdrawing only after the conclusion of the treaty of Ghent, Dec., 1814. John Jacob Astor's company, which had a monopoly of the fur trade in the Great Lakes region, was centred here 1817-34.

McKinley, Mount. Peak of the Alaska range, loftiest in N. America. On the Sushitna-Kuskowim divide, it rises to an alt. of 20,464 ft.

McKinley, William (1843-1901). President of the U.S.A. Born at Niles, Ohio, Jan. 29, 1843, of Scottish-Irish descent, he fought in the Civil War, and after being called to the bar, 1867, settled

for the rest of his life at Canton, Ohio. Republican member of congress 1877-91, as chairman of the ways and means committee, 1890, he passed unsuccessfully sponsored the protectionist tariff called by his name. Having twice served



W. McKinley

as governor of Ohio, he was elected to the presidency in 1896 on a policy of protective tariffs and the gold standard; and his administration saw tariffs raised to their highest point in U.S. history.

The chief external events of his term were the acquisition of Hawaii, 1898, and the war with Spain, 1898, which resulted in the annexation of Puerto Rico, the Philippines, and Guam in 1899. Re-elected in 1900, McKinley was shot, Sept. 6, 1901, by Léon Czolgosy, an American anarchist of Polish extraction, at the Pan-American Exposition at Buffalo, and died on Sept. 14. Theodore Roosevelt, the vice-president, succeeded to the presidency. *Consult* Lives, J. W. Tyler, 1901; E. T. Roe, 1913.

During McKinley's presidency relations between Great Britain and the U.S.A. had been cordial, while the participation of American forces in the expedition which went to Peking to suppress the Chinese Boxers in 1900 marked its first appearance as a world power.

Mackintosh, Sir James (1765-1832). A British philosopher and historian. Born at Alldourie on Loch Ness, Oct. 24, 1765, he attended lectures at King's College, Aberdeen, and studied medicine at Edinburgh. Having graduated in 1787, he removed to London, but abandoned medicine for the law, and was called to the bar in 1795. In 1791 he had published a justifi-



Mount McKinley. The snow-clad peak in central Alaska, near the Arctic circle

cation of the French Revolution, *Vindiciae Gallicae*, in reply to Burke, for which the national assembly gave him the title of a French citizen.



James Mackintosh
After Lawrence

In 1803 he defended Peltier, a French refugee charged with having libelled Napoleon. During 1804-11 he held important positions in Bombay, and then as a Whig entered the house of commons. He was professor of law at the East India College, Haileybury, 1818-24. He died May 30, 1832. A representative of the Scottish school of philosophy, in his *Dissertation on the Progress of Ethical Philosophy*, 1831, Mackintosh advocated a modified form of utilitarianism. He also wrote *History of the Revolution in England*. Consult *Life*, R. J. Mackintosh, 1836.

Macklin, CHARLES (c. 1697-1797). Irish actor and dramatist, whose real name was McLaughlin. After some years with a strolling company, he made his first appearance at Drury Lane, under the name of Mechlin, as Brazen in *The Recruiting Officer*, Oct. 31, 1733. He was the original Colonel Bluff in Fielding's *Intriguing Chambermaid*, and took the part of Squire Badger in the same author's *Don Quixote* in England. He acted at The Haymarket and Covent Garden, also in Dublin, and achieved enormous success as Shylock. Peachum, Polonius, and Iago were among his other parts, which also included Sir Archy McSarcasm and Sir Pertinax McSycophant in his own farce, *Love à la Mode*, 1759, and comedy, *The Man of the World*, 1781. Notorious for his quarrels and lawsuits, he retired in 1789, and died July 11, 1797, being buried in S. Paul's, Covent Garden. Macklin was an excellent comedian, who set his face against "gagging," an excellent if exacting teacher, and a capable stage-manager.



Charles Macklin
1807

MacLagan, WILLIAM DALRYMPLE (1826-1910). British prelate. Born in Edinburgh, June 18, 1826, the son of a doctor, he was educated

at the university there and entered the Indian army in 1847. Leaving in 1852, he went to Peterhouse, Cambridge, was ordained in 1856, and after serving as a curate was made vicar of S. Mary's, Newington, in 1869, and of S. Mary Abbots, Kensington, 1875-79. Next he was made bishop of Lichfield, and in 1891 archbishop of York. He died Sept. 19, 1910. MacLagan wrote the hymn, *The Saints of God*. See *Life*, F. D. How, 1911.

Maclaren, ALEXANDER (1826-1910). British divine. Born in Glasgow, Feb. 11, 1826, he began his ministry at Portland Chapel, Southampton, in 1846. Ten years later he was called to the pastorate of Union Chapel, Manchester, where the eloquence of his preaching made his name widely known, together with his works on biblical subjects. In 1905 he presided over the Baptist congress. He died May 5, 1910.

Maclaren, ARCHIBALD CAMPBELL (1871-1944). English cricketer, born in Manchester, Dec. 1, 1871. From a preparatory school at Elstree he went to Harrow, where he made his name as a cricketer. In 1890 he began to play for Lancashire, and in 1894 was made captain. He was a member of the team that went to Australia in 1894-95, and captain of those that went in 1897-98 and in 1901-02. In England he played against the Australians in five of their tours, being captain in 1899, 1902, and 1909. The score of 424 made by him at Taunton against Somerset in July, 1895, stands as a record in English first-class cricket. He died Nov. 17, 1944.

Maclaren, IAN (1850-1907). Pseudonym of John Watson, Scottish author and divine. Born at



Ian Maclaren

Manningtree, Essex, Nov. 3, 1850, and educated at Stirling grammar school and Edinburgh university, he entered the ministry of the Free Church of Scotland at Edinburgh. During 1875-80 he was minister at Logiealmond and at S. Matthew's, Glasgow. In 1880 he went to

Sefton Park Presbyterian Church, Liverpool, which for 25 years, through his preaching and personality, was one of the most influential of its denomination in England. In 1891 Watson published *Beside the Bonnie Brier Bush*, which brought him fame as a delineator of Scottish life and character, though critics charged him with sentimentality and idealisation. The same faults are to be found in *The Days of Auld Lang Syne*, 1895, and *Kate Carnegie*, 1896. Watson also wrote on theological subjects under his own name, notably *The Mind of the Master*, 1896, an unorthodox study of Jesus Christ. He died at Mount Pleasant, Iowa, May 6, 1907.

MacLaurin, COLIN (1698-1746). Scottish mathematician. Born at Kilmodan, Argyllshire, and educated at Glasgow university, he took his degree in mathematics at 15, and in 1717 was made professor of mathematics at Marischal College, Aberdeen. In 1719 he was made a fellow of the Royal Society, and in 1725 professor of mathematics at Edinburgh. In 1740 he was awarded, with Bernoulli and Euler, the French Academy prize for a dissertation on the tides. He took part against the Young Pretender, 1745, in the organization of the defences of Edinburgh, and as a result of privation died at York, June 14, 1746.

MacLaurin was one of the most brilliant mathematicians of the 18th century, ranking next to Newton. He wrote on curves, the motion of fluids and attractions, and was the author of the important theory in the differential calculus known by his name, by means of which a function of one variable may be expanded in terms of ascending integral powers of the variable. He published *Geometrical Organica*, 1735 (in *Philosophical Transactions*); *Treatise on Fluxions*, 1742, in defence of Newton against Bishop Berkeley; and an unfinished *Treatise on Algebra*, 1748.

MacLay, JOSEPH PATON MACLAY, 1ST BARON (1857-1951). British shipowner. Born Sept. 6, 1857,



1st Baron MacLay, British shipowner
Russell

he was educated at Glasgow, and entered the shipping industry, ultimately becoming head of MacLay and MacIntyre, shipowners of Glasgow. In 1916 he was

appointed shipping controller, and occupied this post until its abolition 1921. A member of the war cabinet, 1918, created baronet 1914, baron 1922, he died April 24, 1951, and was succeeded by his eldest surviving (3rd) son Joseph (b.1899).

Maclean, Sir Donald (1864-1932). British politician. The son of John Maclean of Tiree, he was trained as a solicitor and began to practise in London. In 1906 he was elected Liberal M.P. for Bath. In 1910 he was returned by Peebles and Selkirk, and in 1911 he was made deputy chairman of committees. All the Liberal leaders lost their seats at the general election of 1918, and he was chosen as leader by the remnant of the party in parliament, discharging the duty until the return of Asquith to parliament in 1920. In 1916 he was made a privy councillor, and in 1917 he was knighted. He died Jan. 15, 1932.

Maclean, Kaïd Sir Harry Aubrey de (1848-1920). British soldier. Born June 15, 1848, he entered the army and, stationed in Gibraltar in 1876, he crossed to Morocco, was introduced to the sultan Mulai Hassan, and entered his service, becoming instructor to the Moroccan army and principal counsellor of the sultan. Adopting Moorish habits and customs, he remained loyal in his British sympathies, and in 1901 was knighted for his services to the empire. In 1907 he was captured by Raisuli, and remained a prisoner until ransomed for £20,000 seven months later. He died at Tangier, Feb. 4, 1920.



Kaïd Maclean,
British soldier
Downey

MacLeish, Archibald (b. 1892). American poet. Born May 7, 1892, and educated at Yale, he was instructor in government at Harvard, 1919-21, and from 1923 to 1930 devoted himself to literature. Editor of *Fortune*, 1929-38, he became librarian of congress in 1939 and during 1944-45 he was assistant secretary of state. His publications included *The Happy Marriage*, 1924; *Nobodaddy*, 1925; *The Hamlet of A. MacLeish*, 1928; *Conquistador* (awarded Pulitzer prize), 1932; *A Time to Speak*, 1941; *A Time to Act*, 1943. Of his radio verse dramas the best-known included *The Fall of the City*, 1937; *Air Raid*, 1938.

McLennan, John Ferguson (1827-81). British sociologist and anthropologist. Born at Inverness, October 14, 1827, he studied at Aberdeen and Cambridge, was called to the Scottish bar, 1857, and became parliamentary draughtsman for Scotland, 1871. His essay *Primitive Marriage*, 1865, in which he first discussed the custom of exogamy, inaugurated research into the evolution of kinship and marriage. This and other essays were collected under *Studies in Ancient History*, 1876. McLennan died June 14, 1881.

MacLeod. Scottish clan. It was divided mainly into the MacLeods of Lewis, the branch of Torquil, and the MacLeods of Harris, the branch of Tormod; both branches tracing their ancestry to a remote Laigh the Strong. There were other branches, the MacLeods of Raasay, in Inverness-shire; Cadboll and Glennies, in Ross-shire; and Dunvegan, on the W. coast of Skye. See *Clan*; *Dunvegan*. Pron. Mac-loud.

MacLeod, Fiona. Pen-name under which William Sharp (*q.v.*) wrote a number of Celtic romances.

MacLeod, Henry Dunning (1821-1902). British economist. Born in Edinburgh, March 31, 1821, the son of Roderick MacLeod. M.P., lord-lieutenant of Cromarty, he was educated at Edinburgh academy, Eton, and Trinity College, Cambridge, and in 1849 was called to the bar. His main interest was in economic questions, and he had already, in 1847, framed a successful and popular scheme of poor law relief, first employed on his father's estate, and then elsewhere in Scotland. His writings began with *The Theory and Practice of Banking*, 1856. In 1858 appeared his *Elements of Political Economy*, which, like the earlier work, went into several editions. He started a *Dictionary of Political Economy* and wrote *The Theory of Credit*, 1889-91. He died July 16, 1902.

MacLeod, John James Richard (1876-1935). British physiologist. Born near Dunkeld, Perthshire, Sept. 6, 1876, he was educated at Aberdeen and at Leipzig university. From 1901 to 1903 he held the Mackinnon research scholarship of the Royal Society, and from 1903 to 1918 was professor of physiology at Cleveland, Ohio, subsequently occupying similar positions at Toronto university and at Aberdeen. His most important work was on the nature of the control of the metabolism of carbohydrates in the animal body,

and, together with Dr. Banting, with whom he shared the Nobel prize for medicine in 1923, he achieved fame as one of the discoverers of insulin. Elected F.R.S. in 1923, he was a member of the medical research council, 1929-33. He died at Aberdeen, March 16, 1935. His numerous works include *Practical Physiology*, 1903; *Diabetes*, 1913; and *Carbohydrate Metabolism and Insulin*, 1926.

Macleod, Norman (1812-72). British divine and author. He was born at Campbeltown, Argyllshire, June 3, 1812, and was educated at Glasgow and Edinburgh. Minister at various Scottish churches from 1838 to 1872, he became chaplain to Queen Victoria in Scotland in 1857. Editor of *Good Words*, 1860-72, he was the author of numerous sermons, travel sketches, and stories, including *Reminiscences of a Highland Parish*, 1867. He died June 16, 1872, at Glasgow, where his memory is perpetuated by a statue and by the Macleod Memorial Missionary Institute.



Norman Macleod,
British divine

MacLise, Daniel (1806-70). A British painter. Born at Cork, Jan. 25, 1806, the son of a Scotsman,



Alexander McLeish, he entered a bank, which he left soon after to become a student at the Cork Institute. He early attracted attention by a pencil drawing of Sir Walter Scott in a Bookshop at Cork, 1825, now in the Victoria and Albert Museum. He practised portraits, mostly in pencil, until able to proceed to London, where he entered the R.A. schools in 1828 and gained a gold medal for his *Choice of Hercules*, 1831. He was elected A.R.A., 1835, and R.A. in 1840. MacLise was one of six artists chosen to paint decorations for the house of lords, and began work on the two gigantic historical paintings, *The Meeting of Wellington and Blücher After Waterloo*, finished 1859, and *The Death of Nelson*, finished 1864.

In 1866 he declined the presidency of the Royal Academy. He drew and painted many portraits,

including one of his friend, Charles Dickens, 1839, now in the National Portrait Gallery, and one of John Constable. He illustrated books, such as Moore's Irish Melodies. His chief pictures are Malvolio and the Countess, 1840, and The Play Scene in Hamlet, 1842, both in the Tate Gallery; Puck Disenchanting Bottom (R.A.), 1831; Snap Apple Night (R.A.), 1833; Merry Christmas in the Baron's Hall, National Gallery of Ireland. He died at Chelsea, Apl. 25, 1870. See illus. Ainsworth, W. H.; Campbell, T.; Caxton. Consult Memoir, W. J. O'Driscoll, 1871; The Maclise Portrait Gallery, W. Bates, 1883.

Macmahon, MARIE EDMÉ PATRICE MAURICE (1803-93). French soldier and politician. Born at Sully, Loiret, June 13, 1808, he was a member of a family exiled from Ireland for its loyalty to James II. He entered the army in 1827, and saw service in Algeria. He commanded a division in the Crimean War, and in Italy was responsible for the victory of Magenta, being made a marshal and duke of Magenta as a reward. During 1864-70 he was gov.-gen. of Algeria.



Marshal Macmahon,
French soldier

In the Franco-Prussian War he held a high command, but he was defeated at Wörth, and driven back to Toul. He then took charge of a new force, which he led to Sedan, only, however, to be wounded and taken prisoner. Released at the peace, he was given the task of crushing the communist rising. In May, 1873, he became president of the republic, in succession to Thiers. By no means a convinced republican, he was suspected of favouring a restoration, and was too conservative for many of his countrymen. A crisis in 1877 was not made less acute by his unyielding attitude, and after another crisis in 1879 he resigned. He died Oct. 17, 1893.

McMaster University. Educational establishment at Hamilton, Canada. Founded in 1887, it was endowed by W. McMaster (1811-87). It sprang from a union of the Baptist college at Toronto with a college at Woodstock. A Baptist university, it specialises in training men and women for evangelistic and missionary work, but there are no religious tests for students. In 1880 Woodstock College was separated from it, but Brandon Col-

lege, Manitoba, is affiliated to it. The university has a large library, laboratories, and residential halls for men and women. Originally established at Toronto, the university was transferred to Hamilton in 1930.

Macmillan, HUGH PATTISON MACMILLAN, BARON (1873-1952). British lawyer. He was born Feb. 20, 1873, and educated at Edinburgh and Glasgow universities. He became an advocate in 1897 and took silk in 1912. In 1924 he became lord advocate for Scotland in the Labour ministry, and was made a privy councillor. He acted as chairman of a series of commissions, including the coal-mining industry dispute, 1925; the British Pharmacopoeia, 1926; finance and industry, 1929, which issued the much-discussed Macmillan report; income-tax law codification, 1930; and Canadian banking, 1933. He was a lord of appeal in ordinary from 1930 to 1939 and from 1940 to 1947; during 1939-40 he was minister of Information, the first to hold that position in the Second Great War. Among other positions he occupied were chairman of the Pilgrim trust; member of the Carnegie trust for the universities of Scotland; chairman of the court, University of London, 1929-43; chairman of C.E.M.A., 1941-42, and a trustee of the British museum, Soane museum, and national library of Scotland. He received a life barony in 1930. He died Sept. 5, 1952. Reminiscences, *A Man of Law's Tale*, appeared later in 1952.

Macmillan, DANIEL (1813-57). British publisher. Born at Upper Corrie, Arran, Sept. 13, 1813, he was educated at Irvine, and after an apprenticeship to a bookseller moved, in 1831, to Glasgow. Two years later he obtained employment at Cambridge. In 1843 he set up in business with his brother, Alexander (1818-96), as a bookseller in London, shortly afterwards returning to Cambridge. There, in 1843, he began publishing books of a religious and scientific nature. Success induced him to extend his field, and in



Daniel Macmillan,
British publisher
After L. Dickinson



Lord Macmillan,
British lawyer

1855 he published *Westward Ho* followed two years later by *Ton Brown's School Days*. He died June 27, 1857. Consult *Life*, T. Hughes 1882; *Life of Alexander Macmillan* C. L. Graves, 1910. See *Macmillan & Co. Ltd.*

Macmillan, HAROLD (b. 1894). British politician. A member of the publishing family, he was born Feb. 10, 1894, educated at Eton and Balliol, and served in France during the First Great War. A.D.C. to the governor general of Canada, 1919-20, he became Conservative M.P. for Stockton-on-Tees in 1924. He was defeated in 1929, but re-elected in 1931, retaining the seat until 1945. In Dec., 1942, he was sent as minister-resident to French N. Africa, where a confused situation had developed after the assassination of Darlan, and remained there until 1945. In Dec. 1944, he visited Athens in an effort to effect an agreement between the Greek government and the E.A.M. Air minister in the "caretaker" government of 1945, he lost his seat at the general election. Elected the same year by Bromley at a by-election, he retained the seat in subsequent elections. He was minister of Housing 1951-54, of Defence, 1954-55, Foreign secretary, 1955, chancellor of the Exchequer, 1955-57. He succeeded Sir Anthony Eden as prime minister in Jan., 1957.



Harold Macmillan,
British politician

McMillan, MARGARET (1860-1931). British educationist. Born at Westchester, New York State, U.S.A., July 20, 1860, she was taken to Inverness when five, and was educated there and in Switzerland. A member of the Bradford school board, 1894-1902, she pioneered the cause of physical education, and successfully campaigned for medical inspections in schools. Among the school clinics started by her is the Deptford health centre (1910), the largest in the U.K. In 1917 she founded the first open-air nursery school. She also founded Rachel McMillan college for training infants' teachers as a memorial to her sister.



Margaret McMillan,
British educationist

She was made C.B.E. in 1917, and C.H. in 1930. She died March 29, 1931. *Consult* Life, A. Mansbridge, 1932.

Macmillan & Co., Ltd. British publishing house founded at Cambridge, 1843, by Daniel and Alexander Macmillan. For a short time there was a branch in Aldersgate Street, but the London business proper was founded in Henrietta Street, Covent Garden, in 1858. Removal to Bedford Street took place in 1863, to larger premises near by in 1872, and to St. Martin's Street in 1897, two years after the business had been reformed as a limited company. Educational and theological works are leading features of Macmillan lists; but the authors published by the firm—including F. D. Maurice, Lewis Carroll, T. H. Huxley, Hardy, Kipling, Yeats—represent all branches of literature. *Consult* The House of Macmillan, C. Morgan, 1943.

Macmurray, JOHN (b. 1891). British philosopher. He was born at Maxwellton, Kirkcudbrightshire, Feb. 16, 1891, and educated at Robert Gordon's College, Aberdeen, Glasgow University, and Balliol, Oxford. Macmurray served in the First Great War and was appointed lecturer in philosophy, Manchester University, 1919. He was fellow, classical tutor, and Jowett lecturer in philosophy, Balliol College, 1922-28, and Grote professor of philosophy of the mind and logic, London University, 1928-41. Macmurray became professor of moral philosophy in Edinburgh University in 1944. His published works include *Freedom in the Modern World*, 1932; *Philosophy of Communism*, 1933; *Reason and Emotion*, 1935; *The Clue to History*, 1938; *Challenge to the Churches*, 1941; *Constructive Democracy*, 1943.

Macnaghten, SIR MELVILLE LESLIE (1853-1921). British administrator. Born June 16, 1853, he was educated at Eton, and in 1889 became chief constable of the criminal investigation department, Scotland Yard. He represented the police on the committee appointed by Asquith to inquire into the identification of criminals, 1893-94. He was chief of the criminal investigation de-



Sir Melville Macnaghten,
British administrator
Elliett & Fry

partment, 1903-13. Knighted in 1907, he pub. *Days of My Years*, 1914. He died May 12, 1921.

MacNalty, SIR ARTHUR SALUSBURY (b. 1880). British physician. He was educated at St. Catherine's and Corpus, Oxford, and University College hospital, London, being a medical inspector of the local government board, ministry of Health, 1919-25, and chief medical officer to the ministry of Health and board of Education, 1935-41. In 1941 he was appointed editor-in-chief of the official medical history of the Second Great War. MacNalty, honorary physician to the king 1937-41, was knighted 1936.

Macnaughtan, SARAH (d. 1916). British novelist. Daughter of a J.P., she spent much of her early life in visiting all parts of the world. She had experience as a nurse in the Balkans, and in the South African War, having already achieved some success with her first novel, *Selah Harrison*, 1899. On the outbreak of the First Great War she went with a hospital unit to Antwerp, and in 1915 with the Red Cross to Russia, but returned with broken health, and died in London, July 24, 1916. Her many stories included *The Fortune of Christina M'Nab*, 1901; *A Lane Dog's Diary*, 1905; *The Expensive Miss Du Cane*, 1907; *Peter and Jane*, 1911.

M'Naughten Rules. The rules in English law for determining when a person accused of a crime is exempt from criminal responsibility for the act on the ground that he was insane at the time he did it. In 1843 a jury found Daniel M'Naughten, who had shot Edward Drummond, secretary of Sir Robert Peel, the prime minister, mistaking him for Peel (whom he was under the delusion was persecuting him), not guilty on the ground that he was insane. The verdict caused great dissatisfaction and as a result of a debate in the house of lords, that house put to the judges certain questions to clarify the law. The main effect of their answers, which came to be called the M'Naughten rules, was that, to establish a defence on the ground of insanity, it must be proved that at the time of committing the act the person accused was labouring under such a defect of reason from disease of the mind that either (a) he did not know the nature and quality of the act he was doing or (b) if he did know what he was doing, he did not know that it was wrong.

The rules were subjected to much criticism. One objection was

that a man, quite insane in the ordinary sense, may nevertheless be well aware that an act he is doing is wrong, but be unable because of his insanity to prevent himself from doing the act. Such an act would not be within the rules. The Homicide Act, 1957, to some extent remedied this in charges of murder by introducing the Scots doctrine of diminished responsibility. The act provided that a person was guilty not of murder, but only of manslaughter, if he suffered from such abnormality of mind as substantially to impair his responsibility for his acts and omissions.

In Scotland the rules were adopted to some extent, but they were not so prominent as in England. This is because the wider doctrine of diminished responsibility had existed in Scotland under the common law for nearly a century before it was recognized by the law of England, and pleas of insanity were therefore less frequent.

MacNeice, LOUIS (b. 1907). A British poet. Born in Belfast, Sept. 12, 1907, he was educated at Marlborough and Merton College, Oxford. Lecturer in classics at Birmingham University, 1930-36, and in Greek at Bedford College, London, he was



Louis MacNeice,
British poet

from 1941 a writer of feature programmes for the B.B.C. His early poetry had sometimes a brittle quality, but depth had come when he published *The Earth Compels*, 1938, and *Autumn Journal*, 1939. Of his poetic dramas, *Christopher Columbus* was broadcast on the 450th anniversary of the discovery of America, Oct. 12, 1942; and *The Dark Tower* in 1946. His verse trans. of Goethe's *Faust* (published 1951) was broadcast 1949. Collected poems appeared, 1949, *Ten Burnt Offerings*, 1952, *Autumn Sequel*, 1954. MacNeice pub. *The Poetry of W. B. Yeats*, 1941; and collaborated with W. H. Auden in *Letters from Iceland*, 1937.

McNeile, CYRIL (1888-1937). Real name of Sapper (*q.v.*), author of *Bulldog Drummond* and other adventure stories.

M'Neill, JOHN (1854-1933). A British evangelist. Born July 7, 1854, at Houston, Renfrewshire, son of a foreman quarryman, he was a railwayman before deciding in 1877 to study for the Presbyterian ministry. After training at

Edinburgh and Glasgow universities he was ordained in 1886. He acted as evangelist with D. L.



John M'Neill,
British evangelist
Haines

Moody in Aberdeen in 1892, and conducted successful missions in Great Britain and throughout the world. He was minister of Christ Church, Westminster Bridge Road, London, in 1908, and in 1910 moved to Free S. George's Presbyterian Church, Liverpool. He died April 19, 1933.

MacNeill, JOHN GORDON SWIFT (1849-1926). Irish jurist and politician. Born in Dublin, March 11, 1849, and educated there and at Christ Church, Oxford, he was called to the Irish bar in 1876. In 1909 he was given the chair of constitutional law in the national university. As Nationalist M.P. at Westminster from 1887 to 1918, he became an authority on procedure. His motion disallowing the votes of the directors of the Mombasa rly. defeated the Unionist government in 1892. He procured the abolition of flogging in the British navy, established the principle that cabinet ministers should not direct public companies, and was largely responsible for the Titles Deprivation Act, 1917. Author of *Constitutional and Parliamentary History of Ireland*, 1917, he died Aug. 24, 1926.

Macon. American naval airship constructed as a sister ship to the Akron (*q.v.*). Launched April 21, 1933, 17 days after the loss of the Akron, the Macon was a helium-filled ship of similar size and design, and carried five aeroplanes. She crashed into the sea, as a result of structural failure, Feb. 12-13, 1935. Two lives were lost (of 83).

Mâcon. A town of France. Capital of the dept. of Saône-et-Loire, it stands on the right bank of the Saône, 45 m. N. of Lyons. The chief buildings are the large modern church of S. Pierre and the hôtel de ville. The cathedral of S. Vincent, a fine 13th-century building, was partly destroyed at the Revolution. Watches, casks, and vats are made, and the town gives its name to a wine of Burgundy produced in its vicinity. A town before the Roman invasion of Gaul Mâcon became the seat of a bishopric (suppressed 1790) before 700. It had its own line of counts, and before 1477 was part of the duchy of Burgundy. Pop. (1954) 22,393

Macon. City of Georgia, U.S.A., the co. seat of Bibb co. It is on the Ocmulgee river, at the head of navigation, 88 m. S.E. of Atlanta, and is served by the Southern and other rlys. and by steamers, and an airport. It is the centre of the Georgia peach industry, and other fruit and vegetables are grown there. Its industries include cotton mills, furniture factories, and rly. workshops. A city from 1832, it is the seat of Mercer University, founded 1833. Pop. (1950) 70,252.

McPherson, AIMEE SEMPLE (1890-1944). American evangelist, born in Ontario, Canada, Oct. 9, 1890. Her mother was in the Salvation Army, and she herself began to preach at 17. Her first husband, a Scottish evangelist, took her to the East; on his death she returned to the U.S.A., where she became head of the Elm Four Square Gospel Alliance. The basis of her teaching was divine healing through baptism; her followers underwent total immersion, and she led pilgrimages to perform this rite in the waters of the Jordan. The Angelus temple built for her in Los Angeles cost 1½ million dollars. She was several times married and divorced, and in 1926 disappeared for some weeks in somewhat disreputable circumstances; but in the eyes of her millions of followers she was never discredited. Known to the newspapers as the Hot Gospeller and to converts as Sister Aimee, she died in Oakland, Calif., Sept. 27, 1944.

Macpherson, JAMES (1736-96). Scottish author. Born at Ruthven, Kingussie, Inverness-shire, Oct. 27, 1736, he was educated at Aberdeen and Edinburgh universities. After experience as a bookseller's assist-

ant and a schoolmaster, and encouraged by John Home, he brought out in 1760 a volume entitled *Fragments of Ancient Poetry Collected in the Highlands*. This was followed by two epic poems, *Fingal*, 1762, and *Temora*, 1763, purporting to be translations from a Gaelic poet named Ossian. A heated controversy arose concerning their origin, Samuel Johnson being among those who regarded them as forgeries. While the problem is still an open one, competent critics admit the existence of a Fingal-Ossian legend, but agree that Macpherson's work contains only fragments of Gaelic, that he liberally edited his originals, and interpolated passages of his own.

Macpherson's poems, which display a genuine love of nature in her wilder aspects, played a definite part in the romantic movement, influencing Goethe, Schiller, and Byron, among others, and they were the favourite reading of Napoleon. His prose works include *Original Papers Containing the Secret History of Great Britain from the Restoration till the Accession of George I.* 1775. He was agent to the nabob of Arcot in 1779 and M.P. for Camelford, 1780-90, and died Feb. 17, 1796.

Bibliography. *Journey to the Western Highlands of Scotland*, S. Johnson, 1775; *Inquiry into the Authenticity of Ossian*, ed. M. Laing, 1807; *A. Clerk*, 1870; *W. Sharp*, 1897; *Life and Letters*, T. B. Saunders, 1895; *J. M., an Episode in Literature*, J. S. Smart, 1906. *The Gaelic Sources of Macpherson's "Ossian"*, D. S. Thomson, 1932.

Macquarie. A river of New South Wales. A tributary of the Darling-Murray system, it is 590 m. long. Its basin, a rich pastoral region, contains the centres Bathurst, Wellington, and Dubbo.

Macquarie. Island of the S. Pacific administratively part of Tasmania. It is 20 m. long by 3 m. wide. Sea elephants and king penguins are numerous. The island is a meteorological station, and a rescue station for shipwrecked mariners.

Macquarie, LACHLAN (d. 1824). British soldier and administrator. Born on the island of Ulva, near Mull, Scotland, he entered the army as an ensign in 1777, was on garrison duty in N. America during the War of Independence, saw active service in India and Egypt, 1787-1809; then, a lieutenant-colonel, went with his regiment to New South Wales, Australia, succeeding William Bligh as governor. He was made a major-gen. in 1813. His administration a virtual dictatorship and frequently criticised at



Mâcon, France. Façade of the
cathedral of S. Vincent

home—lasted until 1821. His aim was to make the convicts into good settlers, and in this, despite mistakes, he succeeded at least to the satisfaction of the colonists. He laid out the city of Sydney, made roads into the interior, and built many public buildings. He died in London, July 1, 1824. The Macquarie and Lachlan rivers, N.S.W., Macquarie river, Tasmania, and Macquarie Island were named after him.

Macramé OR MACRAMI (Turkish *magrama*, towel, napkin). Durable lace-like trimming of knotted thread. Of considerable antiquity, it consists of a fringe plaited into a geometrical pattern. Macramé was made chiefly in schools and convents along the Genoese Riviera.

Macready, WILLIAM CHARLES (1793–1873). British actor. Born in London, March 3, 1793, the son of an Irish actor-manager, and educated at Rugby, he made his first appearance at Birmingham as Romeo, 1810. After acting with Mrs. Siddons and Dorothy Jordan in the provinces, he made his first appearance in London at Covent Garden, Sept. 16, 1816, as Orestes in *The Distressed Mother*. In 1819 and 1820 he rose to the front rank with his performances of Richard III, Coriolanus, Hamlet, and Virginius in Sheridan Knowles's tragedy of that name. Leading actor at Drury Lane, 1823–36, he acted in the U.S.A. in 1826–27, and in Paris, 1828.

Manager of Covent Garden, 1837–39, he there produced Lytton's *The Lady of Lyons*, playing opposite Helen Faucit who was also his leading lady at The Haymarket, 1839–41, where he scored great successes in the title-role of Lytton's *Richelieu*, and as Alfred Evelyn in *Money*, also by Lytton. From Dec. 27, 1841, to Jan. 14, 1843, he was manager of Drury Lane, where he made his final appearance as Macbeth, Feb. 26, 1851. He died at Cheltenham, April 27, 1873.

An actor of great talent, painstaking and conscientious almost to a fault, he was a careful student of the classics and did much to purge the Shakespearian drama of Restoration alterations and interpolations. Macready had a magnificent voice and a graceful carriage. Tennyson praised him in a sonnet and Talfourd styled him the most romantic of actors. In his private life Macready was a man of generosity. *Consult* Reminiscences, 1875; Diaries, 1833–51, ed. W. Toybee, 1912; Mac-



W. C. Macready.
British actor

ready as I knew him, Lady Pollock, 1885; Lives, William Archer, 1890; W. T. Price, 1895; J. C. Trewin, 1955.

Macrinus, MARCUS OPILIUS SEVERUS (164–218). Roman emperor 217–218. Born of obscure parents in Mauretania, he became prefect of the praetorian guards, instigated the murder of the emperor Caracalla, and ascended the throne. After his disastrous Parthian campaign, the soldiery proclaimed Elagabalus emperor. Macrinus, defeated near Antioch, was captured and put to death.

MacRobert, LADY (d. 1954). British patriot and philanthropist. Rachel, daughter of William Hunter and Fanny Workman, the Himalayan explorers, was born at Worcester, Mass., and educated at Cheltenham Ladies College, and Royal Holloway College, where she gained the B.Sc. degree. As a postgraduate student she attended Edinburgh University, the Royal College of Sciences and School of Mines in London, and the Mineralogical Institute of Christiania; she later did geological field work in Scotland, Sweden, and the Kolar gold fields of India.

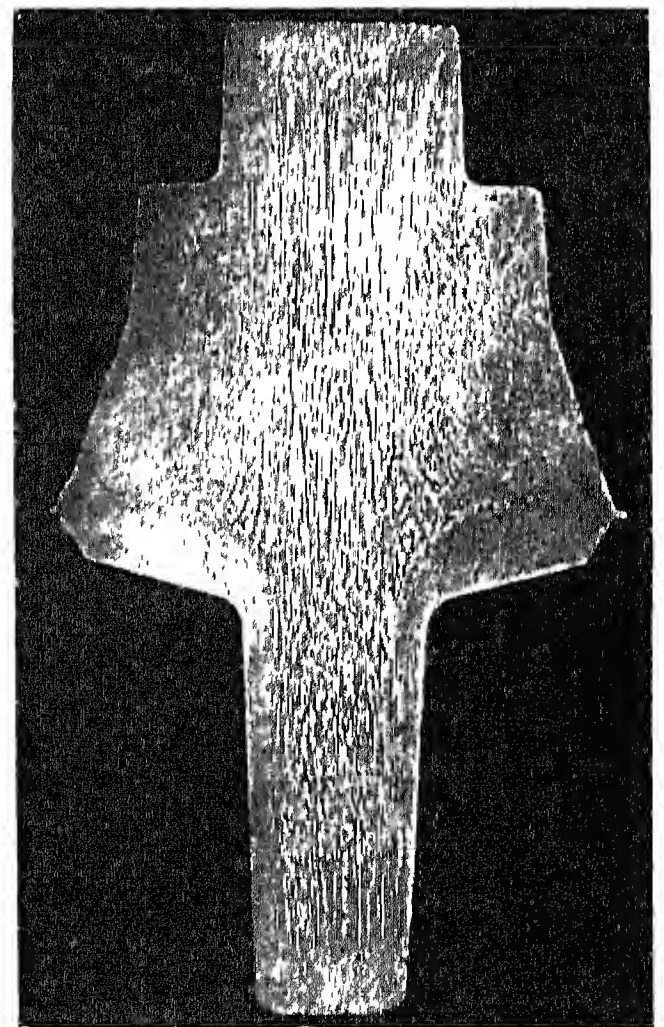
In 1911 she married Sir Alexander MacRobert (1854–1922), created a baronet in 1922; of their three sons, Sir Alastair (1912–38) was killed flying near Luton; Sir Roderic (1915–41) and Sir Ian (1917–41) were killed in action with the R.A.F. In 1941 Lady MacRobert gave £25,000 to the Air ministry to buy a Stirling bomber in memory of her sons; in 1942, £20,000 to buy four fighters; in 1943 Alastair House (destroyed by fire 1952), her Aberdeenshire home, as a leave centre for R.A.F. officers. She died Sept. 1, 1954, leaving £100,000 to charitable trusts she had founded.

Macroom. Market town and urb. dist. of co. Cork, Irish Republic. It is on the river Sullane, 24 m. W. of Cork. There is a castle, built probably in the 12th century and restored later. Surrounding country is studded with remains of feudal and religious edifices. The town has a trade in grain and dairy produce. Market day, Sat. Pop. (1951) 2,280.

MacRory, JOSEPH (1861–1945). Irish ecclesiastic. Born at Bally-

gawley, Tyrone, he was educated at S. Patrick's seminary, Armagh, and at Maynooth College. Ordained in 1885 he became professor of sacred scripture and Oriental languages at Maynooth in 1889. In 1915 he was consecrated bishop of Down and Connor, and from 1928 was archbishop of Armagh and R.C. primate of All Ireland. Made a cardinal the following year, he was papal legate to the national eucharistic congress in Melbourne, 1934. Eloquent both in the pulpit and on the platform, he died at Armagh, Oct. 13, 1945.

Macrostructure. The structure of a section of any metal or alloy viewed with the naked eye or under low magnification. No special apparatus is needed. A section of the sample is cut and roughly polished. The surface is



Macrostructure. Macrograph of an alloy steel forging for the rotor of a pump in a jet turbine engine

etched with suitable reagents, usually acids, rather more deeply than for micro-examination. Different constituents or crystals in different states are selectively etched and so a pattern or structure is revealed. In this way the flow lines of a forging can be seen. In a casting, the order or method of solidification can be deduced from a study of the crystal structure, any non-metallic inclusions being clearly revealed. A variation of this is taking sulphur prints on a steel sample to determine the distribution of the sulphides. Methods of micro-cum-macro-examination have been developed.

MacSwiney, TERENCE JAMES (1879–1920). An Irish politician. Born in Cork, March 28, 1879, and

educated by the Christian Brothers, he was compelled by the early death of his father to work as a bookkeeper from the age of 15. In 1907 he took his degree at the Royal University of Ireland, and in 1911 became organizer and instructor in commerce under Cork county technical instruction committee. He was a keen republican, and some of his contributions to the journal *Irish Freedom* were published posthumously in book form as *Principles of Freedom*. After the outbreak of war in 1914 he founded a journal called *Fianna Fáil*. He was a prominent organizer of the Irish Volunteers and from 1916 underwent several periods of internment. Returned unopposed as M.P. for Mid Cork in the (U.K.) general election of 1918, he supported *Dáil Éireann*. Elected councillor in Cork city in Jan., 1920, he became lord mayor in March when Thomas MacCurtain, his predecessor, was shot dead in his home by masked men. In Aug. MacSwiney was arrested and convicted by a court martial of having under his control a secret police cipher. Repudiating the sovereignty of the British government and the legality of his arrest, he went on hunger strike and died in Brixton prison after 73 days. His martyrdom gave a powerful impetus to the political ideals which he served. Consult *A Short Memoir of T. MacS., P. S. O'Hegarty and D. Corkery*, 1922.

McTaggart, JOHN M'TAGGART ELLIS (1866-1925). British philosopher. Educated at Clifton and Trinity College, Cambridge (where he was lecturer, 1897-1923), he established himself in the front rank of contemporary European philosophers. His theories were developed from Hegel's idealism, and with Bradley may claim to have established neo-Hegelianism. Among the most brilliant logicians of his day, McTaggart exerted influence mainly as a teacher. He published *Studies in Hegelian Dialectic*, 1896; *Studies in Hegelian Cosmology*, 1901; *Commentary on Hegel's Logic*, 1910. He died Jan. 18, 1925.

McTaggart, WILLIAM (1835-1910). British painter. Born Oct. 25, 1835, at Aros, Argyllshire, he studied art in Edinburgh in 1852. In 1859 he was elected A.R.S.A., in 1870 R.S.A.; and in 1878 he was made vice-president of the Royal Scottish Water Colour Society. He died near Edinburgh, April 2, 1910. McTaggart painted with feeling and imagination scenes of Scottish

country life, sea pieces, and portraits. His works include *The Pressgang*, 1865; *A Ground Swell*, Carradale, and *The Fishers Land*, 1878; *On the White Sands*, 1880; *The Coming of S. Columba*, 1895; and *The Emigrants*.

MacWhirter, JOHN (1839-1911). British painter. He was born at Slateford, near Edinburgh, March 27, 1839. Educated at Peebles, he entered the school of design in Edinburgh, and in 1854 exhibited his first picture at the R.S.A. Elected A.R.S.A. in 1864, he exhibited for the first time at the R.A. in 1865. He became A.R.A. in 1879 and R.A. in 1893. His paintings include scenes in the Scottish Highlands and the Italian Alps. He died in London, Jan. 28, 1911. One of his pictures, *June in the Austrian Tirol*, is in the Tate Gallery; his *Constantinople and the Golden Horn* is in the municipal gallery, Manchester.

Madagascar. Island in the Indian Ocean, belonging to France. It lies off the E. coast of Africa, the



Mozambique Channel separating it from the mainland, about 250 m. away. Its area is estimated at 241,094 sq. m. Extreme length from N. to S. is 980 m.; from E. to W. extreme breadth is 360 m. It includes S. Marie and several other islands off the coast. Antananarivo is the capital and the only large town. Tamatave is the chief port, others being Majunga, Diego Suarez, and Tuléar.

The island is mountainous, especially in the centre and E., but less so in the W. Two great plateaux which cover much of it

are separated by a low ridge. There are many extinct volcanoes, Ankaratra being nearly 9,000 ft. high. The coastline is almost unbroken, save on the N.W., and there are consequently few bays or good harbours, except that of Diego Suarez, where is a govt. dry dock. The longest river is the Mangoka. There are lagoons on the E. side, but few lakes. The climate is tropical.

In 1955 the pop. of 4,777,225 included 66,089 French, 3,417 other Europeans, and 21,346 of Asian origin. Of the native Malagasy peoples the most numerous are the Hovas, who number about a quarter of the whole. The Betsileo, Betsimisaraka, Tanala, and Sakalava are others. Each has its own tongue, but that of the Hovas is generally used.

The country is administered by a high commissioner, assisted by a government council. An assembly of Europeans and Malagasies is chosen by electoral colleges. There is an elaborate system of administering justice; at its head is a court of appeal, and there are courts in four principal towns and in the various provinces and districts. The revenue is obtained from a poll tax, and taxes on land, houses, and cattle. There are also import duties, while the government owns the postal and telegraph services. Education is compulsory up to 14, and all children learn French. In the capital is a school for the study of native medicine.

The chief occupation of the people is agricultural. The main crops are rice, potatoes, maize, haricots, tapioca, sugar, coffee, cocoa, and hemp. Forest trees yield valuable timber, e.g. mahogany, ebony, and rosewood. Indian rubber, copal, and other gums are plentiful, as is graphite. Bark for tanning is another export. Six million head of cattle are kept, hides being exported and meat preserved. Gold, copper, lead, iron, and corundum are found. The island has 16,000 m. of roads, but only four rlys.

During the long period since the separation of the island from the mainland a great differentiation has taken place in the wild life of the two, and they are now mostly quite unlike. The mammals of Madagascar are few and small, though fossil and semi-fossil remains of a hippopotamus show that some of the larger African beasts came so far E. before the insulation. Mammals peculiar to Madagascar are the lemurs, including the true lemurs, the Indris and the Cheirogale, and the allied aye-

aye (*q.v.*). Endemic carnivora include two species of *Cryptoprocta*, *C. ferax* being like an enormous weasel 3 ft. long; while tenrecs (*Gentetes*), the largest 12 to 16 ins. long, tailless, and with a long, flexible snout, and several allied genera represent the insectivores. Among the native birds nearly 100 species are peculiar to Madagascar, as also are between 20 and 30 species of chameleons and numerous insects.

The flora is abundant, varied, and specialised. Several plants have become well known as curiosities of vegetation, such as the "traveller's-tree," which provides for the thirsty by collecting large supplies of water in the sheaths of its leaves. The lattice-leaf is a veritable wonder, and among the economic plants peculiar to Madagascar are landolphia, producing rubber, the raphia-palm, and the beautiful evergreen tree *Astrapeia wallichii*.

HISTORY. Madagascar was discovered in 1500 by a Portuguese navigator, and was long known as the isle of St. Lawrence. It was then peopled by a number of tribes at first independent of each other, with settlements of Arabs.

Growth of French Power

About 1700 the French established military posts on the island, but it was not until well into the 19th cent. that they really began to take possession. At the time of the Napoleonic Wars they surrendered their posts on the island, and in 1811 Tamatave was temporarily occupied by the British. King Radama, who began to reign in 1810, allowed Christian missionaries to enter the island, but after his death in 1828 they were expelled, the native Christians persecuted, and Europeans and their wares excluded. In 1861 missionaries and traders were readmitted.

In 1865 Great Britain and France agreed to respect the independence of Madagascar, which, under Ranavalona II, a queen who began to reign in 1868, had a fairly strong army, and a system of administration directed by Europeans. It was thought by the British that steady support of the Hovas rule would be the best policy. The French, however, soon took up a different attitude. In 1840 they had obtained a protectorate over a small chieftain, but it was more or less dormant until 1878. They then renewed their claim, and in 1883 sent an ultimatum to the queen. The demands were refused, and Tamatave was bombarded and taken. The war lasted until 1885, when the French obtained Diego Suarez

and a certain control over the foreign policy of the island. In 1890 the protectorate of France was recognized by Great Britain, but it needed another war to make the natives accept it. In 1895 the capital was entered by French troops, and on Aug. 6, 1896, Madagascar was officially declared a French colony.

After the defeat of France in June, 1940, Madagascar remained under Vichy control until on May 5, 1942, British forces landed in Diego Suarez bay on the N. with the object of forestalling a possible Japanese occupation of the island, which would have imperilled Allied lines of communication with the Middle and Far East (the Mediterranean being closed). The gov.-gen. offered resistance, but Diego Suarez was captured by the 8th. The gov.-gen. showing no disposition to enter into an arrangement with the U.N., a further landing was made at Majunga, Sept. 10. Antananarivo fell Sept. 23, and hostilities ceased Nov. 5. Gen. Legentilhomme (*q.v.*) arrived in the island in Jan., 1943, and took over responsibility as high commissioner for Fighting France. See *Malagasy*.

Bibliography. Fifty Years in Madagascar, J. Sitoe, 1924; Native Races of Africa and Madagascar, Sir J. Frazer, 1938; The Drama of Madagascar, Howo, 1938; Across Madagascar, Chapman, 1943.

Madam Butterfly. Opera in 2 acts by Giacomo Puccini. Produced at La Scala, Milan, Feb. 17, 1904, it received a lukewarm reception; revised by the composer, it was performed at Brescia three months later. The first London performance was given at Covent Garden in 1905, with Destinn as Cho-Cho-San (Butterfly), Caruso as Pinkerton, and Scotti as Sharpless. The opera, one of the most popular in the modern repertory, is notable for the intensity of its emotional appeal, e.g. the love duet and the aria One Fine Day.

The libretto by Luigi Illica and Giuseppe Giacosa, was derived from an American magazine story by John Luther Long which, dramatised by Belasco as *Madame Butterfly*, was a sensational success in New York in 1899, and in London the following year.

Madame Bovary. Novel by Gustave Flaubert. Its writing occupied the author more than four years, from the beginning of 1852 to May, 1856. It appeared in the *Revue de Paris* the same year, and achieved little more than a *succès de scandale*, a charge of immorality

being brought against author and publisher. Both were acquitted, and the novel appeared in book form in 1857. It marked the beginning of a new school of objective realism, and its influence on such writers as Daudet and Zola was far-reaching. It tells with masterly detachment the story of the sentimental, unsatisfied wife of an unromantic country doctor.

Madame Sans-Gêne. Nickname of Thérèse Figuer (1774-1861). Born at Talnay, Côte d'Or, daughter of a grain merchant, at the age of 19 she was enrolled in a cavalry regiment and saw service at Hohenlinden, Toulon, Austerlitz, Jena, and Waterloo, had four horses shot under her, and was a prisoner at Lisbon and Southampton. In 1818 she married Clément Sutter, a dragoon, and, left a widow, died in poverty Jan. 4, 1861. She is sometimes confused with La Maréchale Lefebvre, duchess of Dantzic, through the play by Victorien Sardou and Émile Moreau, produced at the Vaudeville, Paris, Oct. 17, 1893. In the title-rôle of this play Gabrielle Réjane (*q.v.*) made one of her most successful and brilliant impersonations.

A three-act comedy, with a prologue, adapted by J. Comyns Carr from the French play, was produced at The Lyceum, London, April 10, 1897, Henry Irving taking the part of Napoleon and Ellen Terry the title-rôle. The Duchess of Dantzic, a romantic opera in three acts on the same theme, by Henry Hamilton, with music by Ivan Caryll, was produced at The Lyric, Oct. 17, 1903; and an opera, *Madame Sans-Gêne*, by Umberto Giordano, at the Metropolitan Opera House, New York, Jan. 25, 1915.

Madang. A seaport of New Guinea, formerly known as Friedrich Wilhelmshafen. It stands on Astrolabe Bay, in the N.E. of the island, and was the commercial capital of the German protectorate, Kaiser Wilhelm's Land, occupied in Oct., 1914, by an Australian force. (See *Papua*.) In Japanese hands from the beginning of 1942, Madang was on a coastal motor road constructed by the enemy. It was recaptured, April 24, 1944, by the Australian 7th div. after an advance straight over the 5,600 ft. range (see *Shaggy Ridge*) lying close to the coast. The harbour is protected by several islands, on one of which, Beliao, is a hospital for Europeans. It exports copra, trepang, mother-of-pearl, and gold. Pop. (white) 208.

upper reaches are obstructed by rapids and cataracts. Its drainage basin is estimated at 425,000 sq. m.

Madeira Islands. Small group in the Atlantic belonging to Portugal. They lie about 440 m. W. of Mogador, on the Moroccan coast, and 670 m. S.W. of Lisbon. They consist of Madeira (*q.v.*), Porto Santo, 22 m. to the N.E., the only other permanently inhabited island, and the Desertas, three rocky islets 11 m. to the S.E., and have a total area of 308 sq. m. The islands rank as a maritime district incorporated in Portugal. Population (1950) 269,769.

Madeleine, LA. Paris church dedicated to S. Mary Magdalene. It stands at the beginning of the Grands Boulevards, facing the Rue Royale. Modelled on the temple of Jupiter at Athens, and begun in 1764, when Louis XV laid the first stone, it was completed in 1843. It is 354 ft. long, 141 ft. wide, 98 ft. high, is surrounded by a Corinthian colonnade, and has a Grecian façade raised high above the boulevard and approached by 28 steps. The richly decorated interior contains some beautiful sculptures and other works of art. Napoleon wished to make the building a temple of glory; Louis XVIII restored it to its original purpose and gave it its name. See illus. in p. facing p. 6353.

Madeley. A ward of the borough of Wenlock, in Shropshire, England. Situated on the Severn, 7 m. N.E. of Much Wenlock, it includes Ironbridge and Coalbrookdale, and has large ironworks. A colliery near by, opened in 1860, was closed in 1957.

Another Madeley is in Staffs, near the Cheshire border.

Mad Hatter, THE. Member of the famous tea party described in Lewis Carroll's story for children Alice's Adventures in Wonderland. See Mad Tea Party; also Alice's Adventures illus.

Madhya Bharat. A rajpramukh's state of the republic of India, 1950-56. After India was given independence in 1947, the rulers of the states of Alirajpur, Barwani, Dewas (Senior), Dewas (Junior), Dhar, Gwalior, Indore, Jaora, Jhabua, Jobat, Khilchipur, Kathiawara, Kurwai, Mathwar, Narsingarh, Piploda, Rajgarh, Ratlam, Sailana, and Sitamau formed at Gwalior city in 1948 the united state of Gwalior, Indore, and Malwa, renamed Madhya Bharat in 1950. Mohammadgarh and Pathari and the Bhumia states of Nimkhara, Jammia, and Rajgarh were later merged in the union, of

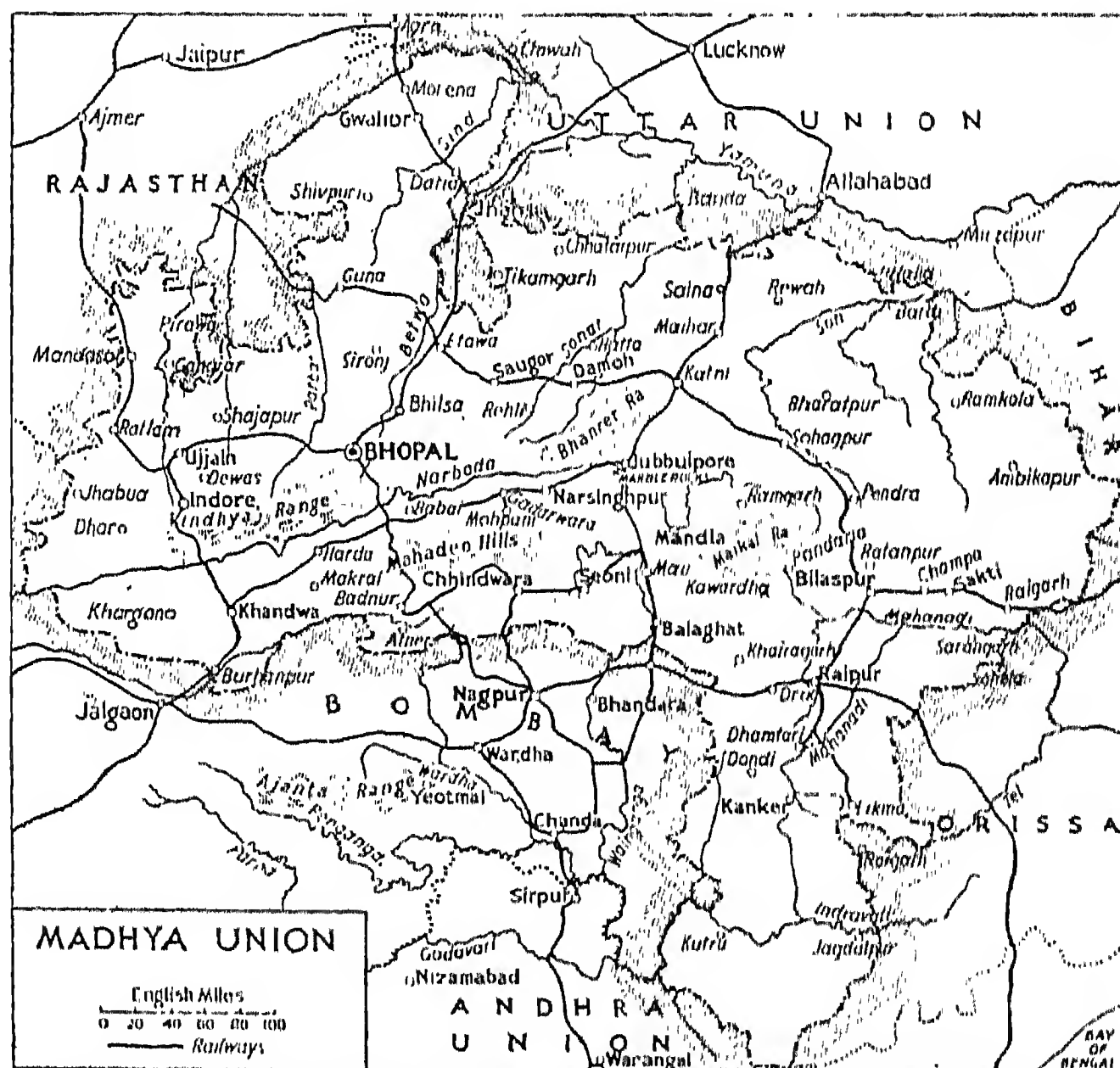
which Gwalior was the winter, Indore the summer, capital. The maharaja of Gwalior was installed as rajpramukh. Madhya Bharat had a population in 1951 of 7,941,642. Its area was 46,710 sq. m. At the reorganization of the states in 1956 it was absorbed in Madhya Union.

Madhya Union OR MADHYA PRADESH. State of the republic of India. It was so named in 1950, when it consisted of the former province of British India called Central Provinces and Berar and the Makrai and Chattisgarh princely states, absorbed in the province in 1948. It was reorganized in 1956 to include Madhya Bharat, Bhopal, and Vindhya Union (*qq.v.*), at the same time losing several districts in the S.W. to Bombay. It is bounded on the W. by Rajasthan,

bal, and Betwa. Rainfall is adequate and much of the soil is excellent. Cotton is produced in quantity; other chief crops are rice, wheat, maize, ground nuts, and pulses. Nearly a third of the state is covered by forests.

Cotton textile making is the chief industry. Cement is made, sugar refined, and there are potteries and glassworks. Jute and rayon goods also are produced, and a number of cottage industries persist. Coal, iron, manganese, asbestos, and limestone are the main mineral products; marble is quarried near Jabulpore.

Madison. Capital of Wisconsin, U.S.A., and co. seat of Dane co. Built on an isthmus between Lakes Mendota and Monona in the Four Lakes district, 81 m. W. of Milwaukee, it is served by rly. and



Madhya Union, state of India, as reconstituted in 1956

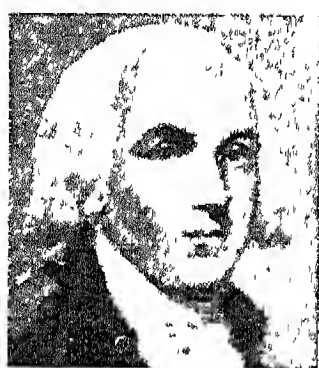
on the N. by Uttar Union, on the E. by Bihar and Orissa, on the S. by Bombay and Andhra Union. The capital is Bhopal. Area 171,200 sq. m. Pop. (1956 est.) 26,100,000.

The state is mountainous in the N.W., where the Aravali, Vindhya, and Satpura ranges cross it; the S.E., also wild and mountainous, is inhabited by forest tribes. S. of the Mahadeo Hills lies a plain watered by the Wainganga r. which farther E. widens into the valley of the Mahanadi r. Other rivers include the Narmada, Cham-

three airports. A leading educational centre, it has seven state and university libraries. The state university has 1,000 acres of grounds beside Lake Mendota; the imposing white granite capitol, in a wooded park, has a dome 286 ft. high (exceeded in height only by the Capitol at Washington, D.C.). Machine tools, farm, dairy, and hospital equipment are made; food is processed; there are railway shops, and near by limestone quarries. Madison was selected as capital in 1836 on the formation of Wisconsin Territory. It was

chartered as a city in 1856. Pop. (1950) 96,050.

Madison, JAMES (1751–1836). President of the U.S.A. Born at Port Conway, Virginia, March 16, 1751, he was educated at the College of New Jersey, graduating in 1771. As a delegate to the Virginia revolutionary convention, 1776, he helped to draft the constitution of that state, and was a member of the Virginia council of state 1778–79.



James Madison

He was a delegate to the continental congress, 1780–83; and to the Philadelphia convention of 1787, summoned to draw up a constitution.

After the publication of the text of the proposed constitution, Madison, with two collaborators, wrote a series of 85 essays, published in book form as *The Federalist*. Elected president in 1808, re-elected in 1812, he lost popularity on account of his inept leadership during the American War of 1812, popularly called "Mr. Madison's war." He died at Montpelier, Virginia, June 28, 1836. Consult *The Writings of James Madison*, 1900–10.

Madison Square. Area at the junction of Fifth Avenue and Broadway, New York City. On the E. side is an office building with a 50-storey tower. Another tower overlooking the square is that of Madison Square Garden, one of the city's largest buildings devoted to amusement. The amphitheatre, used for horse shows and circuses, is chiefly known for the boxing matches staged there. It contains also a theatre, a concert hall and ballroom, a restaurant, and a roof garden.

Madoc OR **MADOG** (c. 1150–80). Traditional Welsh discoverer of America. He was one of the younger sons of Owain Gwynedd (d. 1170) and, on disputes as to the succession, is said to have sailed to the west with 300 men in ten ships. The earliest mention of him is in a mid-15th-century poem, and it was about a century later that his voyage was associated with the discovery of America. His story forms the subject of

Robert Southey's long narrative poem, *Madoc*, published in 1805.

Mad Parliament. Derisive name given by the court party to the parliament that met at Oxford in June, 1258. The country was roused to anger by the extravagance of Henry III, and by the favour he showed to his alien friends, and this parliament was responsible for the reforms called the Provisions of Oxford (q.v.).

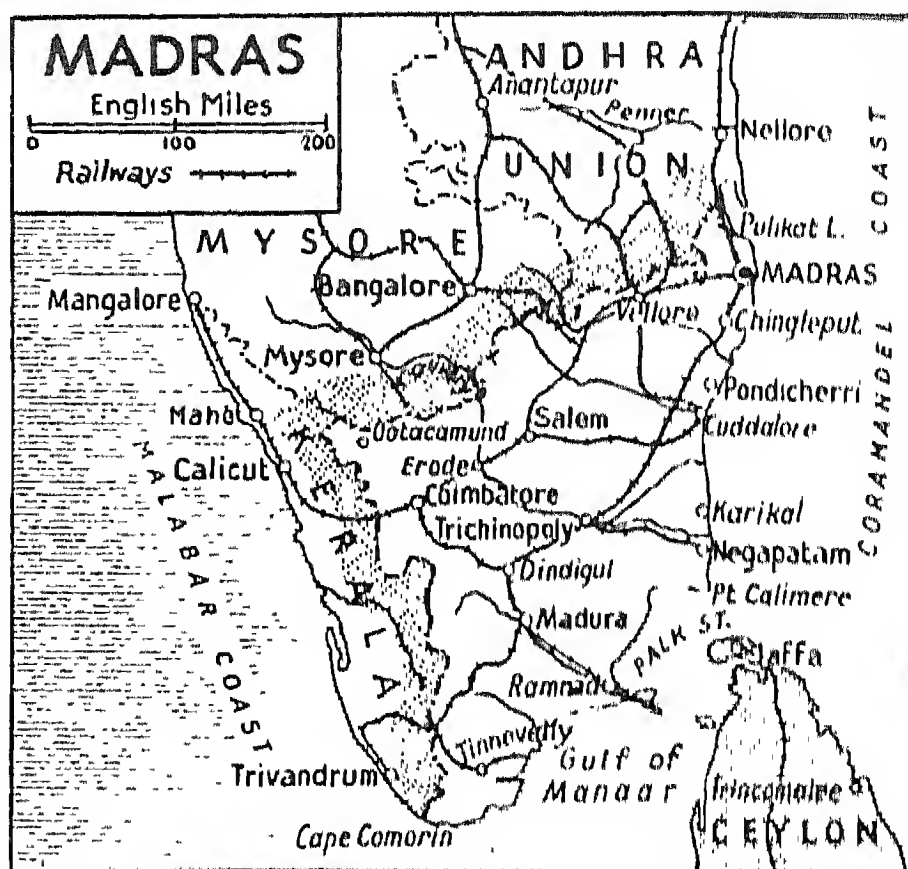
Madras. State of the republic of India. It lies in the extreme S.E. of the country, and is bordered W. by Kerala, N. by Mysore and Andhra Union, E. by the Bay of Bengal, S.E. by the Strait of Palk and the Gulf of Manaar. The capital is Madras city; other large towns are Chingleput, Coimbatore, Trichinopoly, and Madura.

A large part of the state lies on the Deccan plateau; and it includes the southern part of the Eastern Ghats and the coastal plain at their foot. The chief rivers, all flowing eastwards, are the Palar, Penner, Cauvery, and

Vaigai. Industries include textile weaving, tanning, sugar refining, tobacco manufacture, and electrical engineering. Magnesite, bauxite, limestone, and china clay are among mineral products. About 14 p.c. of the state is forested; 7 p.c. is barren. The chief crops are rice, millet, ground nuts, and pulses; bananas, mangoes, and citrus fruits are grown. Nearly a third of the 17,000,000 acres under cultivation is artificially irrigated. Area 50,170 sq. m. Pop. (1956 est.) 30,000,000.

When India achieved independence in 1947, the British province of Madras (p. 1.) became part of the new dominion. In 1948 the princely states of Bangannapalle and Pudukkottai were absorbed in the province, in 1949 that of Sandur. This area became a state of the republic of India in 1950. The north-east part of the state was detached in 1953 to form the state of Andhra; and in the reorganization of 1956 Madras lost all its former west coast districts.

Madras. Province of British India. It occupied the major part of the Deccan peninsula, and comprised three sections, part of the Malabar coast on the W., the whole of the Coromandel coast on the E., and a considerable area in the plateau S. of the princely states of Hyderabad and Mysore. The Eastern and Western Ghats met in Madras in the Nilgiri Hills. South of them the Palghat Gap was a 16-m.-wide break in the W. Ghats. The rivers of the Malabar coast are



Madras, state of India, as reconstituted 1956



short, and relatively unimportant. The main rivers of the S. Deccan flow from the W. Ghats across the peninsula; only the lower courses of the Godavari and Kistna, and the middle and lower sections of the Cauvery, were in Madras; smaller rivers within the province included the Penner, Palar, Ponnaiyar, Vaigai, and Tambraparni, none of them navigable, but nearly all used for irrigation. The Laccadive Islands to the S.W. were administered by Madras.

Climate and Products

The whole of the province had a hot climate; the W. had a regular, heavy monsoon rainfall; the E. had somewhat uncertain rains from the monsoon in the N., and from the N.E. trades during the cooler months in the S.; the inland areas were liable to drought. On the lower levels temperature varied from about 75° F. in Jan., the coolest month, to about 88° F. in May, the end of the hot dry season.

Beryl, corundum, graphite, manganese, and mica were the chief minerals; gold, iron, copper, lead, and other minerals were also found. Forest covered about 20,000 sq. m. of the province.

Madras city was the capital; other large towns were Madura, Trichinopoly, Coimbatore, Salem,

Calicut, Bezwada, Guntur, Mangalore, Tuticorin, Cocanada. Telugu was spoken in the N.E., Tamil in the S.E., Malayalam in the W. In the hills lived animistic pre-Dravidian peoples; the more civilized people were Dravidians, the great majority of Hindu religion.

The main events in the history of the area that formed British Madras date from the arrival of Vasco da Gama in 1498. In 1639 Fort St. George, which became Madras city, was erected on behalf of the East India co.; by that date English, Portuguese, Dutch, and Danish factories were in existence, and French settlements followed in the next few years. In 1741 Dupleix became governor of Pondicherry; five years later Madras surrendered to a French fleet under De Labourdonnais, and the conflict between French and English culminated in the victory of Wandewash in 1760. In 1780 the first, in 1790 the second, and in 1799 the third Mysore wars were waged against Tippoo, who was slain at Seringapatam.

Tippoo's possessions were parcelled out. Kanara, Coimbatore, and Wynaad became British; the Nizam's portion, Anantapur, Bellary, Cuddapah, and Kurnool were ceded to the British in 1800, and

the area was constituted the presidency of Madras under Lord North's Regulating Act of 1773. In 1937 it was made an autonomous province, area 126,000 sq. m., which passed to the dominion of India in 1947.

Madras. City of India, capital of Madras state. Situated on the Coromandel coast, it has an artificial harbour which has helped to make it the fifth seaport of India and the chief port of the Deccan.

The city grew up round Fort St. George, a trading settlement of the East India co. founded by Francis Day in 1639, the fort and S. suburbs being the European quarters, later moved to Egmore, Chetpet, Kilpauk, etc. N. of the fort lay Black Town, renamed George Town in 1905, which became the commercial centre of the city. George Town and Triplicane are densely peopled; and in Triplicane are the chief Hindu temples. Napier, Robinson, and the People's Parks are the chief open spaces in addition to the island, an open space between two arms of the Cooum river, near the fort. The Marina, along the sea front, contains the Marine Aquarium and Madras University buildings. S. Thomé, S. George's, and the Roman Catholic cathedrals are historic buildings. S. Mary's is the



Madras, India. 1. Central station. 2. Hindu temple in the China Bazaar. 3. View from the roof of the Bank of India showing the High Court with the Christian College on the right. 4. The High Court

earliest English church in India (1680). S. Andrews is the Scottish kirk (1821). The Observatory dates back more than a century; it sets the time for India and Ceylon, and issues weather reports and storm warnings. The memorial hall, museum, Connemara public library, and Victoria memorial building are notable edifices. Government house, first acquired by the East India co. in 1752, was the governor's residence until 1947, when it was made over to the government for the accommodation of the legislature.

Four main rlys. join the city with Calcutta, Bombay, Calicut, and Tuticorin. The harbour, which is entirely man-made, is unsafe during storms, and the port suffers somewhat from competition with the minor ports of the Deccan. Madras exports the produce of the state, chrome ore, cotton, oil seeds, and hides, and imports machinery, coal, grain, and timber. There are no great manufactures. Pop. (1951) 1,429,985. In the First Great War Madras was the only Indian city to come under enemy attack, when it was shelled by the German raider Emden in 1914.

Madras, UNIVERSITY OF. This university, founded in 1857, was formerly purely an examining body, but in 1923 it was reorganized as a teaching and residential university with control over the quality of the teaching given by the fifteen constituent colleges and the thirty-one affiliated colleges of the university in the province of Madras. Of the constituent colleges, six prepare candidates for degrees in arts and science, four in teaching, one in law, two in medicine, one in engineering, and one in veterinary science. The endowment funds amount to about £60,000.

Madre de Dios (Sp., Mother of God). River of S. America. Called by the natives Amaru-Mayu, and the chief affluent of the Beni (q.v.), it rises in the S.E. of Peru, flows N.E. through Bolivia, and empties into the Beni at Rivera Alta, not far from the confluence of the latter with the Mamoré. It has a course estimated at 900 m.

Madre de Dios. Department of S.E. Peru. It was created in 1912, and named after the river. Its capital is Maldonado. With an area of 58,827 sq. m., the estimated population in 1956 was 33,000.

Madrepore (*Madreporaria*). An order of the Anthozoa consisting of the true corals. The polyps secrete carbonate of lime in the

form of stony plates against the folds of their skin and in a solid form below their base, thus causing them to rise. The madrepores are the principal builders of coral foundations. See Coral.

Madrid. Central prov. of Spain. It is bounded W. by Avila and Segovia, E. by Guadalajara, and S. by Toledo. Elevated and largely mountainous, the Sierra de Guadarrama running along its N.W. boundary, the climate is bleak and cold in winter and very hot in summer. Rainfall is deficient, ex-

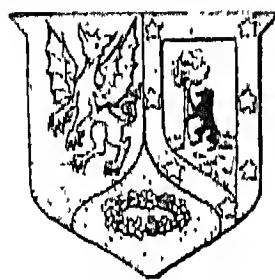
cept on the heights; the S.E. part is the best watered and fertile, producing vines, fruit, cereals, oil, esparto, and vegetables. There are quarries of granite and freestone, and the mountains contain minerals, which, however, are not fully exploited. The forests in the N. and N.E. yield timber for building purposes, charcoal, and firewood. Agriculture and horticulture are the chief occupations. Besides the capital, large towns are Aranjuez and Villaverde. Area 3,089 sq. m. Pop. (1950) 1,926,311.

MADRID: CAPITAL OF SPAIN

Alfonso Lopez, Spanish Writer and Translator

The history and physical features of the Spanish capital are here described. The Prado museum has its own entry, and the relation-ship of Madrid to the country as a whole is described under Spain

The capital of Spain and of the prov. of Madrid, the city of Madrid stands on a plateau, at an elevation

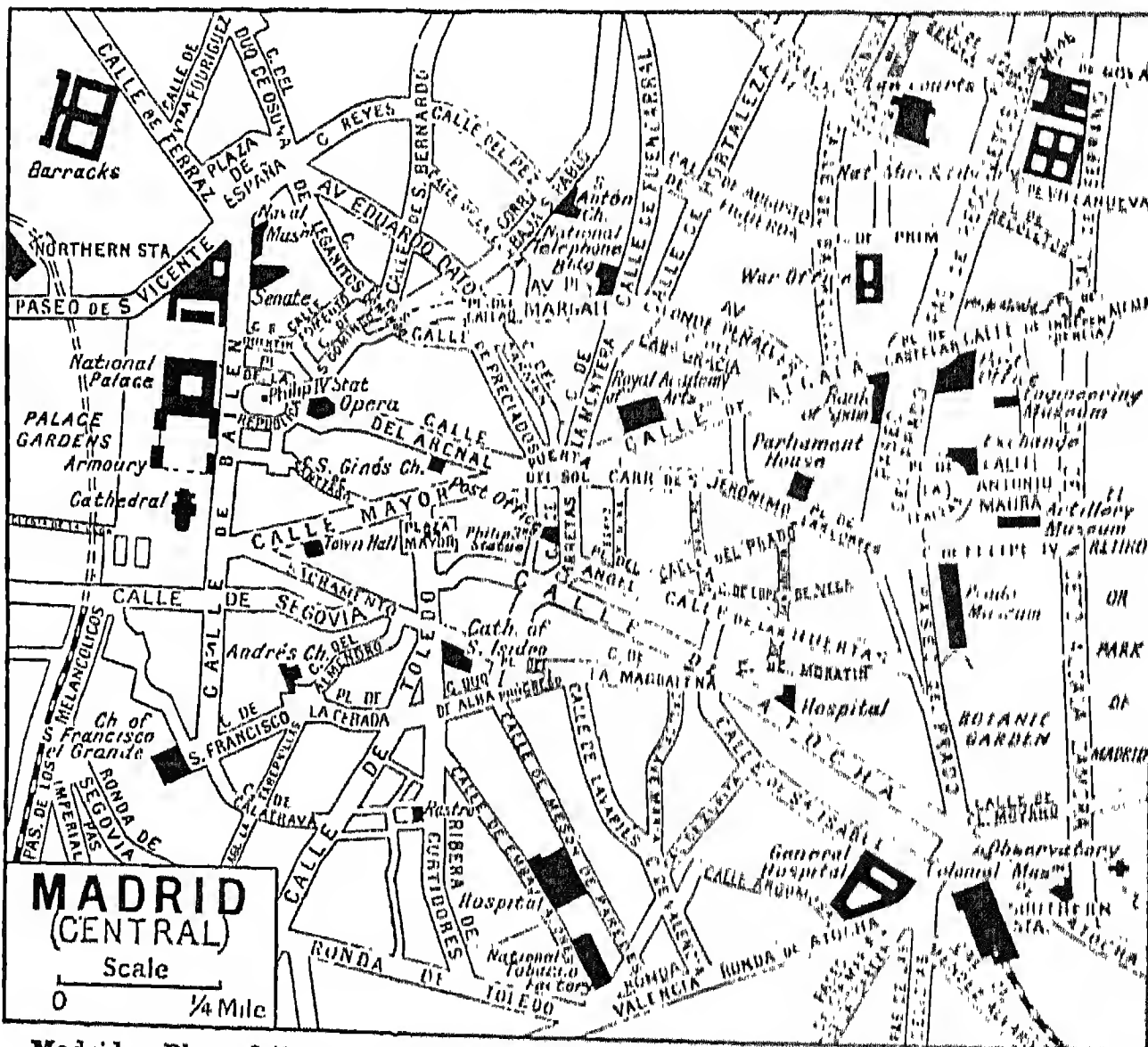


Madrid arms

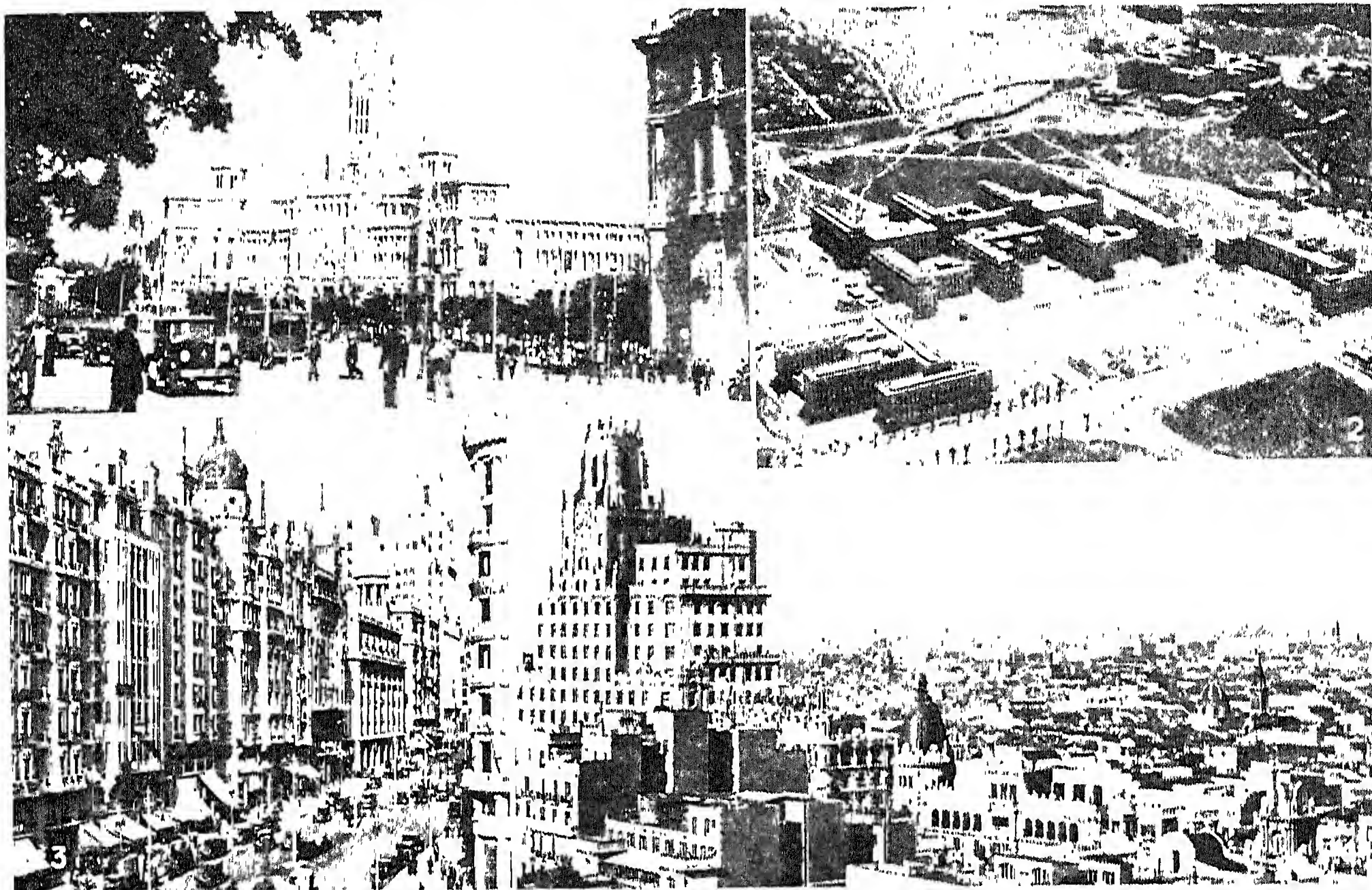
of 2,400 ft., surrounded by an extensive, arid plain, S. of the Guadarrama Mts., 41 m. direct N.N.E. of Toledo. The Manzanares river, which is waterless during the summer, is spanned by several fine bridges. The centre of the peninsular rly. system, the city communicates with Franco by two lines and with Portugal by three. Madrid has the most variable climate of any town in Spain, and its death rate is high.

Exposed at different seasons to icy winds and scorching sun, the extremes of temp. are not only seasonal, but daily, the variation sometimes exceeding 50° in one day.

Almost surrounded by public parks and gardens, Madrid has many wide streets, large squares, avenues, and promenades; but in the older parts of the town the streets are narrow, dingy, and badly paved. The chief square, Puerta del Sol, is in the centre of the city and is the focus of activity. From it radiate ten streets, the finest being the Calle de Alcalá, which traverses the magnificent boulevard, del Prado, flanked by handsome squares, public buildings (including the Prado museum,



Madrid. Plan of the central part of the Spanish capital, indicating positions of principal buildings



Madrid, Spain. 1. General post office. 2. University city, in course of construction to the N.W. of the capital: left, centre, and right, pharmacy, medical, and dentistry buildings respectively: in the background (right) are hospital blocks. 3. Avenida Margall, a shopping street. 4. General view of the city, with the national telephone building on the left

tamous gallery of painting and sculpture, and the Academy of the Spanish language), and by botanical and other gardens. The chief park, the Retiro, lies to the E. of this district.

Debouching W. from the Puerta del Sol, the Calle del Arenal leads to the Plaza de Oriente (la Republica), the largest square, and to the royal palace. The square contains a beautiful fountain with bronze lions and the striking equestrian statue of Philip IV, surrounded by 44 other statues of Visigothic and Spanish kings. The palace, a massive six-storied building, 500 ft. square by from 80 ft. to 165 ft. high, faces the Plaza de Armas, with the Armoury, a world-renowned collection of arms and armour. In another open space rises the new cathedral, founded in 1883. To the N. of the palace are the ministry of marine with naval museum, and the senate; to the W., sloping to the Manzanares, are the palace gardens, themselves flanked with avenues, and connected by bridges with the Casa de Campo, an extensive park.

Another important street, running W. from the Puerta del Sol, is the Calle Mayor; it passes near the Plaza Mayor, a spacious square, with a famous equestrian statue of Philip III. This square was long used for ceremonies, tournaments,

bull-fights, executions, autos-da-fé, horse-races, etc. Here, in 1812, after the British entry into the city, the constitution of Cadiz was proclaimed. Here also occurred several riots, and the Federalists, in 1873, removed the statue from its pedestal. On the S. side of the Calle opens the Plaza de la Villa, with the town hall. The Carrera de San Jeronimo, running E. from the Puerta, leads past the Palacio del Congreso, or parliament house, through the Plaza de las Cortes to the Prado.

The building of the national library and museums, in the Paseo de Recoletos, contains one of the most important libraries in Europe, with over 1,000,000 vols.; the archaeological museum, containing prehistoric and ethnological objects; and the museum of modern art with an extensive collection of paintings and sculptures. In the Retiro or park of Madrid, with numerous fountains and statues, and a small zoological garden, is a colonial museum and library. The university, transferred from Alcalá de Henares to Madrid, 1836-37, has a valuable collection of books and MSS. A vast university city, to the N.W. of the capital, founded in 1928, was still in course of construction 20 years later.

The greatest development of Madrid dates from 1914. Since then

a great new artery, the Gran Vía, running from E. to W., and the new general post office, one of the largest and finest buildings in the Prado, have been completed; new parks and squares have been laid out; the Manzanares river has been canalised, and three underground rly. lines totalling 20 m. in length have been constructed.

The city contains 23 hospitals, many orphanages, asylums, and other philanthropic institutions; a chamber of commerce and industries, guilds, workmen's clubs and associations. The churches are of little antiquarian interest or architectural merit. San Isidro, the old cathedral, dates only from 1651. Among Madrid's many industries are the manufacture of tobacco, leather goods, furniture, fans, porcelain, glass, carpets, tapestry, carriages, chemicals, corks, soap, paper, plate, guitars, jewelry, confectionery, cards, perfumes, etc. There are works connected with iron, copper, and zinc. Its book and publishing trade is important.

Latin and Arab scribes mention Medina Majorit, as they called Madrid, as existing in the 10th cent. It was recaptured from the Moors in 1083. At first a frontier fortress and royal hunting-lodge, it became a residence of the kings. It received a charter in 1202, and the Cortes assembled there in 1309.

Philip II made it his capital in 1561. It had then only 30,000 inhabitants, but the city quickly grew, although up to about 1650 it presented but a poor appearance. Even up to the reign of Philip IV (d. 1665) Madrid was unpaved. The uprising of the people of Madrid on May 2, 1808, was the beginning of the Spanish War of Independence against Napoleon. Madrid was captured from the French by the Allies under Wellington in 1812. Its monasteries were suppressed in 1836. Rlys. were introduced in 1850, and an abundant water supply was laid on in 1858.

In the Civil War

When Gen. Franco led a rising of the Foreign Legion in Morocco, July, 1936, the Madrid garrison, like most of those in Spain, rose in revolt, July 17, but was overpowered, July 19, by a workers' militia raised by the govt. Franco's forces captured Badajoz, Irun, and San Sebastian, and advanced on the capital in a convergent attack of four columns (the "fifth column" being his sympathisers inside the city). The government moved to Valencia on Nov. 6, and next day the siege of Madrid began; it lasted until March 28, 1939, when the city surrendered. The defence was reinforced Nov. 8, 1936, by the International Brigade (*q.v.*). Fighting, heaviest during the first six months, wrecked the suburb of Carabanchel and much of the university city, but the rest of Madrid suffered lightly, although subjected to bombing by Italian and German aeroplanes as well as to artillery bombardment. The last of the republican govt.'s

forces surrendered shortly after the fall of Madrid; and on Oct. 18, 1939, Franco transferred his government from Burgos to the capital. He reopened the partly restored university city Oct. 12, 1943. Pop. (1950) 1,618,435.

Madrigal. Musical composition with secular words, in contrapuntal style. It is used for voices in three or more parts, without separate instrumental accompaniment. Some madrigals had the label "Apt for viols or voices," indicating that the instruments could take the place of, or assist, the voices. The Netherlands school of composers was early in this field in the 15th century, when it was represented by Okeghem, Tinctor, Hobrecht, Josquin des Prés, and others. These were followed in the 16th cent. by Arcadelt, Verdelot, Waelrant, Willaert, and Orlando di Lasso. The Italian school, a little later than that of the Netherlands, included Festa, Palestrina, Anerio, Marenzio, Croce, the Gabriellis, Orazio Vecchi, Gastoldi, and others. In England the madrigal reached its climax in the Elizabethan and early Stuart periods, and was associated with the names of Byrd,

Morley, Weelkes, Este, Ford, Wilbye, Dowland, Benet, Hilton, and Orlando Gibbons. See Music.

Madsen Gun. Type of light machine-gun or automatic rifle, invented by a Danish engineer and named after the Danish war minister. The gun depends for its action on the recoil of the barrel. In appearance it is similar to an ordinary rifle, and may be fired from the shoulder, either as an automatic or for single shots. The barrel is fitted inside a perforated casing; the cartridges are fed in segment-shaped magazines, each holding 25 rounds; the magazine is clipped vertically to one side of the breech mechanism-chamber. See Machine-Gun.

Mad Tea Party. Episode in Alice's Adventures in Wonderland, by Lewis Carroll. Alice finds the Mad Hatter, the March Hare, and the Dormouse having tea, and their conversation, which reaches a kind of insane logic, has given rise to many quotable phrases and allusions. See illus. p. 303.

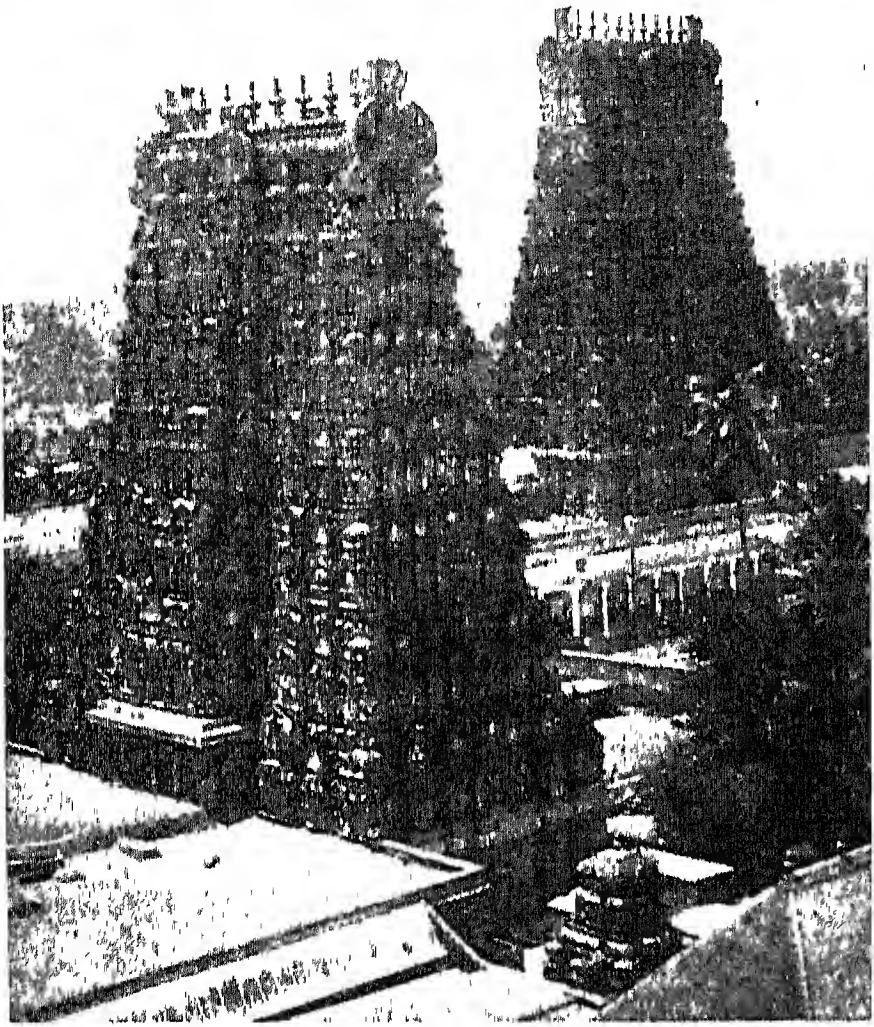
Madura. Island of Indonesia. It is situated to the N.E. of Java, from which it is separated on the W. and S. by the Strait of Madura (1½ m. wide on the W.). With some insular dependencies it formed a residency of Java; it was autonomous 1918-50, then became part of the republic of Indonesia. The Madurese are fishermen and cattle rearers, who speak a distinctive tongue. Area, 1,700 sq. m. Pop. 1,800,000.

Madura. District and town of India, in Madras state. The district is situated in the middle of the S. portion of the Deccan. To the W. are the Western Ghats; it is drained by the Vaigai river. The Periyar river flows down the Ghats to the Arabian Sea; a dam has been constructed, and the conserved water is led through a tunnel in the mountains to irrigate Madura. Of the total area, 60 p.c. is cultivable, but only three quarters of this is tilled; the chief crops in cultivation are food grains, rice, and cotton.

Madura town is situated on the Vaigai. The capital of the ancient Pandyan kingdom, it is an historic town and a great religious centre. The great temple of Sundareswara, with a hall of a thousand pillars, is the chief building. Brass vessels



Madrid: scenes in the Civil War. Lower, bomb devastation at the entrance to the underground station in the Puerta del Sol. Upper, ruins of the Segovia bridge over the R. Manzanares



Madura, India. Two of the ten magnificently carved gate towers of the temple of Sundareswara, which covers an area of 25 acres

and cotton cloths are manufactured, and textile mills have been established. District: area, 4,910 sq. m.; pop. (1951) 2,891,817. Town: pop. (1951) 361,781.

Madvig, JOHAN NICOLAI (1804-86). Danish classical scholar, born on the island of Bornholm, Aug. 7, 1804. He was professor of Latin language and literature at Copenhagen, 1829-48, and then minister of public worship and education until 1851. He then resumed his professorship, retiring in 1876, and dying Dec. 12, 1886. He had a European reputation as one of the foremost textual critics, especially of Cicero and Livy. His most important works were an edition of Cicero's treatise *De Finibus*, 1839, Latin Grammar, 1841, and a text of, and emendations to, Livy. A work on the constitution and administration of the Roman state, 1881, written in a more conservative spirit than some previous works on the subject, was less favourably received.

Macander. An English form of the Greek name Maiandros of a river (mod. Mendere) of Asia Minor. Rising near Celaenae (Dincir) in Phrygia, it flowed W. with a sinuous course that has become proverbial. After being joined by the Lycus it traversed Caria, and discharged into the Aegean Sea. The English word meander (*q.v.*), used literally and figuratively in reference to a winding course, comes from this name.

Maecenas, GAIUS CILSIUS (c. 68-8 B.C.). A Roman patron of letters. Of an old Etruscan family,

he was a man of great wealth and high culture, and became the intimate friend and adviser of the emperor Augustus. Virgil and Horace were two of many men of letters under great obligation to Maecenas, whose name has become a popular synonym for a generous patron of the arts and literature.

Maeldun. Hero of a series of ancient Irish tales narrated in the form of an account of a wonderful voyage. Maeldun is the son of Ailill of the sept of the Owens of Aran and a nun; he is brought up by a queen, friend of his mother, and arrives at man's estate before he learns the story of his birth and

of how his father had been slain. He sets out to find his father's murderer, and visits the most marvellous islands on his voyage. Tennyson tells some of the tales in his poem, *The Voyage of Maeldune*.

Maelstrom (Dutch *malen*, to grind; *stroom*, stream). Strong tidal current in the channels S. of Moskenesö, an island in the Lofoten group, N.W. Norway. Formerly reputed to be a whirlpool which meant certain death to the mariner caught in its eddy, as in a tale by Poe, it is dangerous only at certain states of the tide when also a fierce N.W. wind is blowing.

Maenad (Gr., mad woman). Name in Greek mythology for one of the frenzied female companions of the god Bacchus or Dionysus, called also Bacchae and Bacchantes.

Maerlant, JACOB VAN. Flemish poet of the 13th century. He was probably born on the island of Voorne and died near Bruges, having been employed as parish clerk at Maerlant and later at Damme. He wrote romances after the fashion of the time, but soon struck a more serious vein and wrote scientific and historical books. One of the most learned men of his day, he produced a rhymed Bible, 1271, which led him into trouble with the Church. In 1283 he began a voluminous work, which his death left unfinished, an edition of *The Mirror of History* by Vincent of Beauvais.

Maes, NICHOLAS (1632-93). Dutch painter. Born at Dordrecht, he was a pupil of Rembrandt. His early work shows deficiency of feel-

ing; two examples are the *Reverie* and *Grace*, in the Rijksmuseum, Amsterdam. Later he painted life-size figure subjects, such as *The Card Players*, in the National Gallery, London.

During 1655-67 he produced his best work, in the form of smaller genre works, e.g., *The Dutch Housewife* and *The Idle Servant*, and portraits, e.g., *Portrait of a Man*, all in the National Gallery. The last part of his life was occupied with fashionable portraits. He died in Amsterdam.

Maeshowe. Largest prehistoric sepulchral mound in N. Britain, near the stone circles of Stenness, Orkney. It is a barrow 36 ft. high, 92 ft. in diameter, with a 35-ft. ditch. A passage 54 ft. long leads from the W. to a chamber 15 ft. square, with a corbelled roof of unhewn flagstone slabs and three side cells. The walls bear Norse designs and 900 runes, scored in 1152 by Viking pilgrims on the way to Jerusalem.

Maesteg. An urban district of Glamorganshire, Wales. It stands on the Llynfi river, 8 m. N. by W. of Bridgend, and is served by rly. Maesteg owes its existence to the development of the S. Wales coalfield. Pop. (1951) 23,141.

Maestoso. Italian term used in music, meaning in a stately or majestic manner.

Maestricht. A town of the Netherlands also spelled Maas-tricht (*q.v.*).

Maestrichtian. In geology, a group of soft yellowish limestones containing fossil corals and bryozoa of Upper Cretaceous Age. The group is named from its occurrence near Maastricht (or Maestricht) in Limburg, the Netherlands.

Maeterlinck, MAURICE POLYDORÉ MARIE BERNARD, COUNT (1862-1949). Belgian poet, dramatist, and mystic. He was born at Ghent, Aug. 29, 1862, educated at the Jesuit college of S. Barbe, and studied and for a time practised law in Ghent. Later in Paris he came under the influence of Villiers de l'Isle Adam and his fellow symbolists. In 1889 he published a first volume of verse, *Serres*



Nicholas Maes, Dutch painter



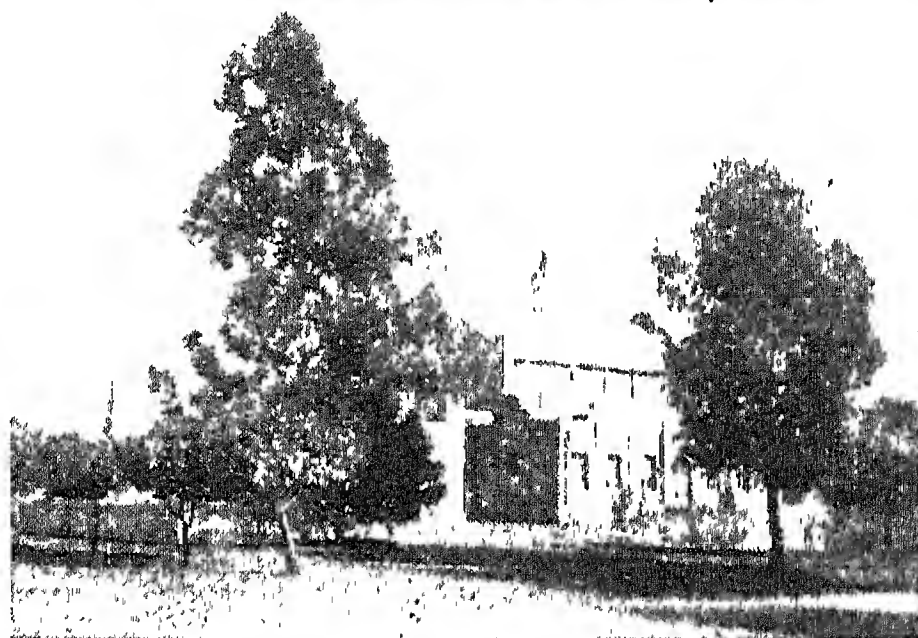
Maurice Maeterlinck, Belgian poet

Chaudes (Hot-houses). Four plays followed in 1890, of which *La Princesse Maleine* was eulogised in the *Paris Figaro* by Mirbeau. *Pelléas et Mélisande*, 1892, later formed the libretto for Debussy's opera. There followed *La Mort de Tintagiles*, 1894; *Monna Vanna*, 1902; *L'Oiseau Bleu*, 1909 (The Blue Bird); translations by Ford, Emerson, Novalis, and Ruysbroeck. In prose Maeterlinck wrote *Le Trésor des Humbles*, 1896; *La Sagesse et la Destinée*, 1898; *La Vie des Abeilles*, 1901; Collected essays, *Le Double Jardin*, 1904, and *L'Intelligence des Fleurs*, 1907; *La Mort*, 1913. His play, *The Burgomaster of Stilemonde*, 1918 (London 1919), dealt with Belgium under German occupation 1914-18.

He described his plays as written for marionettes, and his prose as verse in solution. As a rule his plays depend rather on mood than movement, suggestion of the event rather than its presentation; they are attempts to clothe mystical conceptions in concrete form. His chief absorption earlier was with the mystery of matters beyond life; but in the 20th century he showed a reaction from mysticism. The marks of his method have been described as parallelism, symbolism, suggestion, and the use of realistic means for romantic effects. In 1911 he was awarded the Nobel prize for literature. In 1914 his works were placed on the papal index. He was made a count in 1932, and died at his home in Nice, May 6, 1949. *Consult* *Life and Works*, J. Bethell, 1913.

"Mae West." Life jacket used by airmen in the Second Great War. Worn by all air crew, the jacket was coloured bright yellow to make it easily distinguishable from the air, and was inflated by the wearer. As it gave him a rather bulky appearance, it received the nickname of "Mae West," after the U.S. actress of that name with the well-curved figure. *See* *West, Mae*.

Mafeking. Town of Cape Province, S. Africa. It is 490 m. S.S.W. of Bulawayo, and 189 m. W. by N. of Johannesburg by rly. Here in an imperial reserve are the administrative h.q. and commercial centre of the Bechuanaland protec-



Mafeking, South Africa. Town Hall, opened in 1904; on the left is the Siege Memorial

By courtesy of the Commissioner for South Africa

torate. It was the starting point of the Jameson Raid, 1896. Pop. 5,081. A mile away is the native town on Molopo river. This is administered by Daralong chiefs, who are free from European control, and has a pop. of about 3,000.

Mafeking, SIEGE OF. Operation during the S. African War. Lasting from Oct. 13, 1899, to May 17, 1900, the defence of the little frontier town by Col. R. S. S. Baden-Powell aroused intense interest, and the news of its relief led to spontaneous wild jubilations in London and elsewhere, bringing into common use for at least a decade the new verb "to maffick." The garrison consisted of 700-800 trained troops, assisted by a few hundred townspeople, while the Boer forces under Cronje numbered at first about 10,000, supplied with modern breech-loading guns. The attack was conducted on leisurely lines, and though the town was shelled with some persistency its



"Mae West." Fleet Air Arm pilots in the life jackets which were given this nickname

outer defences were pierced only once, May 12, and the affair resulted in the capture of 97 Boers. On May 1 the town was relieved by Col. Manon and Col. Plumer, who had joined forces. The casualties of the garrison were 35 killed, 101 wounded, and 27 prisoners. Boer losses were estimated at 300. What appealed most to the public at home was the air of high-spirited audacity with which Baden-Powell conducted the defence and organized the garrison. *See* *South African War*; *consult* *The Siege of Mafeking*, J. A. Hamilton, 1900; *Mafeking, a Diary of the Siege*, F. D. Baillie, 1900.

Maffei, FRANCESCO SCIPIONE (1675-1755). Italian archaeologist and dramatist. Born at Verona, June 1, 1675, he was author of the famous tragedy *Me-ropé*, produced at Modena in 1713, and translated into English in 1740. As archaeologist his greatest work was *Verona Illustrata*. He died in Verona, Feb. 11, 1755.



Scipione Maffei, Italian archaeologist

Mafia. Name of a Sicilian secret society. Its origins are traced to the ill-disciplined forces of gendarmerie instituted in Sicily by Ferdinand IV in the early part of the 19th cent., and in general objects the body was similar to the Camorra. When the society was an organized whole, its members, known as *Mafiosi*, were admitted after trial of skill with the dagger, accepted a primitive code of honour, and were sworn to defy all established forms of justice. Their deeds partook of the nature of the vendetta. Reaching its highest pitch about 1860-70, the Mafia carried on robbery, smuggling, and murder; strongest in and around Palermo, it showed itself also in Italy, and attempts at suppression were made in 1874-75. In 1902 two *Mafiosi* were sentenced at Bologna to 30 years' imprisonment for murder. Outrages attributed to the Mafia, some of whose members were driven abroad, took place in the U.S.A., notably at New Orleans in 1890 and 1895. The society was broken up in 1928 by Mussolini and the prefect of Palermo. *See* *Camorra*; *Vendetta*.

Mafia. Island lying off the coast of Tanganyika Territory between Kilwa and Dar-es-Salaam. Formerly part of the territories of the sultan of Zanzibar, it was

occupied by Germany in 1890 and was captured by the British in Feb., 1915. The area is 178 sq. m. See Tanganyika Territory.

Magadha. Ancient kingdom of India. It lay S. of the middle Ganges in Bihar, the capital being first Rajgir near Gaya, and afterwards Patna. In the 4th century Magadha acquired the upper Ganges basin. Chandragupta (*q.v.*), founder of the Maurya dynasty, was the first in history to establish an Indian empire, conquering all the N. from sea to sea, and making the Hindu Kush his frontier against the Greeks. On the death of his grandson Asoka (*q.v.*), the empire decayed, and was destroyed 184 B.C.

Magadi. Lake in the S. centre of Kenya colony. It is connected with the Uganda rly., and contains enormous deposits of carbonate of soda. The lake is 30 m. long from N. to S., and forms a basin of internal drainage. See Alkali.

Magalhães, FERNÃO DE (*c.* 1480-1521). Portuguese navigator, more generally known as Ferdinand Magellan (*q.v.*).

Magallanes. Province of S. Chile. It is all that part roughly S. of lat. 48°, above which lies Aysen. It includes all the islands of the W. and S. coasts, all of the coasts of the Strait of Magellan, half of Tierra del Fuego, and most of the Fuegian Archipelago. The narrow strip of mainland is mountainous and deeply indented; the islands are separated by deep channels and rocky coasts; and the fjords and glaciers resemble those of Norway. Coal, copper, and gold are found, and timber is felled. Foxes and other furred animals are bred. Area, 52,285 sq. miles. Population (1952) 55,119.

Magallanes OR PUNTA ARENAS (Span., sandy point). Seaport town of Chile, capital of Magallanes territory. It stands on the E. coast of Brunswick Peninsula, in the Strait of Magellan, and is the most southerly town on the mainland of America. A coaling station and a port of call for ships passing through the strait, it is a distributing centre for S. Patagonia and the Falkland Islands. In the vicinity are coal, copper, and gold mines. Timber, wool, hides, frozen meat, and tallow are exported. The town has a British club, golf course, and facilities for ice sports. Pop. (1952) 34,410.

Magangue. Town in the N.W. of Colombia. Standing near the confluence of the Magdalena and Cauca rivers, it is the principal port for the products of the savannas

of Bolivar dept., *e.g.* cattle, coffee, cheese, and fruit. Pop. 17,000.

Magazine (Arabic). A term, originally meaning store, now used in a military sense. It means:

(1) The chamber or reservoir of a rifle into which a number of cartridges can be placed, and from which they are automatically fed into the chamber singly.

(2) The removable clips, boxes, or drums, in which cartridges are placed for use in automatic pistols and rifles, and some machine guns.

(3) The buildings in which explosives or ammunition are stored. These buildings are generally of special construction and subject to stringent regulations. They must be fireproof and provided with efficient lightning conductors, whilst no one is allowed to approach the site with matches, smoking materials, or a light or fire of any description. If the magazine contains bulk explosives, all persons entering the building must either change their shoes, or put on overshoes, so that grit will not be introduced. The construction of magazines is such that, in case an accidental explosion occurs, the main force will not be exerted in a lateral direction. Some are built underground.

(4) The compartments on board naval vessels where the ammunition is stored.

Magazine. Form of periodical literature intended to provide varied information and amusement. In general usage the term usually implies a monthly publication, but even so there is a clearly accepted distinction between the magazine and the serious review. At the same time, certain private periodicals are commonly spoken of as magazines, *e.g.* school magazines, parish magazines, and the journals of business houses. By analogy the varied feature pages of a newspaper are sometimes called magazine pages.

The history of the magazine may be said to begin with the publication of *The Gentleman's Magazine*, 1731. During the second half of the 19th century the magazine underwent a great transformation, due first to the growing vogue of the short story, and secondly to the development of process illustration. The turn of the century saw the peak of the illustrated magazine's popularity, with such periodicals as (in Great Britain) *The Strand*, *The Windsor*, *The English Illustrated*, *The Royal Cassell's*, *Pearson's*, *Macmillan's*, etc., and (in the U.S.A.) *Harper's*, *Lippincott's*, *Munsey's*, etc., sup-

plying month by month, usually for sixpence, a generous assortment of popular information and high-class fiction for home and family reading, illustrated by photographs and by well-known artists in black-and-white. Many households took pride in an array of bound volumes of their favourite magazines, for at that period all advertising matter was rigidly excluded from the sequence of pages and was therefore denied permanence. There were also several famous magazines more specialised in their appeal, *e.g.* *The Quiver* (religion), *The Wide World* (adventure), *C. B. Fry's* (sport), *The Studio* (art), *The Bookman* (literature), as well as those for boys (*The Captain*), girls (*The Girl's Realm*), and younger children (*Little Folks*), and many others.

Later developments were the all-fiction magazine, and an increase in page size to accommodate more striking pictorial display and a more effective use of advertising matter. The principle of the "turn-over" was generally adopted, that device, to which the public gradually became accustomed, by which magazine features are continued at the back of the book among the advertisements. On the other hand, the pocket-size format also became popular during the 1930s, as seen in such publications as *The Countryman* and *Lilliput*. As the result of the paper shortage during and after the Second Great War, several magazines adopted the pocket size, *e.g.* *The Quiver*, *The Boys' Own*. Colour printing gave additional attraction to the appearance of many magazines. From America came new ideas in specialisation as seen in such ambitious publications as *Esquire* and *Fortune*. But the chief development between the two Great Wars was the great increase in the number and quality of magazines directly appealing to women readers. Such a periodical as *Woman's Journal* may be considered representative of the very best type of magazine production in which old traditions are successfully blended with up-to-date processes.

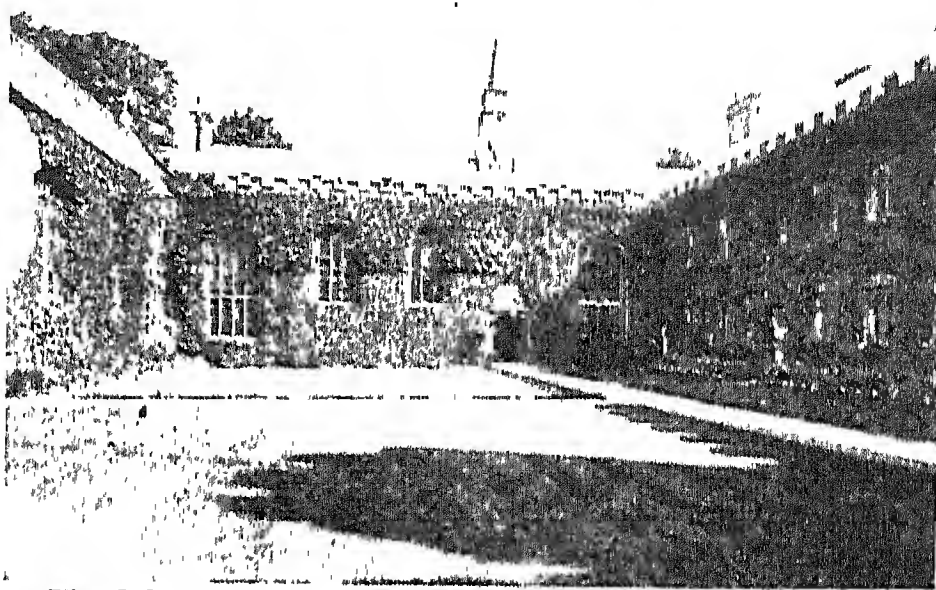
Magdala OR MAKDALA. Fortress of Abyssinia. It stands about 150 m. S.E. of Gondar, on a plateau over 9,000 ft. high. This plateau, less than a mile square and protected by precipices, was fortified by the emperor Theodore. In 1860, having seized the British consul and other foreigners, he carried them off to Magdala and, in spite of repeated requests, refused to release them. An expedition was

therefore fitted out under Sir Robert Napier, and on April 13, 1868, the fortress was taken by storm. It was then utterly destroyed. Napier was created Lord Napier of Magdala. The fortress was afterwards rebuilt, and is now a position of strategic importance. Under Italian occupation, 1936-41, a motor road was built to link it with Dessie.

Magdalen. Small group of islands of N. America. They lie about 50 m. N. of Prince Edward Island in the Gulf of the St. Lawrence, belong to Quebec prov., and were known in early times as Les Îles Ramées. At low tide Amherst, Grindstone, Allright, Coffin, Goose, and East islands are connected by sand bars. Entry and Deadman's are distinct islets. Except the latter, all contain red sandstone cliffs and hills. The people, mainly of French origin, chiefly depend on lobster fishing and canning. Coffin island, which curves round Pleasant Bay, is 35 m. long. The Bird Isles form a sanctuary for hosts of sea birds. Pop. of group, 13,300.

Magdalena. Largest river of Colombia, S. America. It rises in the S.W. of the republic, near the Pic de Azacar, at the junction of the Central and E. Cordilleras, flows N. through the Andean valley, and discharges into the Caribbean Sea by Barranquilla (*q.v.*), after a course of nearly 1,000 m. The area of its drainage basin is est. at 96,000 sq. m. It is navigable up to Honda, a distance of about 600 m., and a rly. for a short distance from there opens up another navigable stretch of 200 m. to Neiva, but the river is subject to drought.

Magdalena. Department of N.E. Colombia. It is bounded N. by the Caribbean Sea, E. by Venezuela, and W. by the river Magdalena. In the N. rises the Sierra Nevada de S. Marta; elsewhere are llanos, lakes, and swamps. Well watered and timbered, the dept. produces bananas, maize, coffee, cocoa, and sugar. The minerals include copper, gold, silver, and coal. Horses and cattle are reared on the grassy uplands. The chief industries are agriculture,

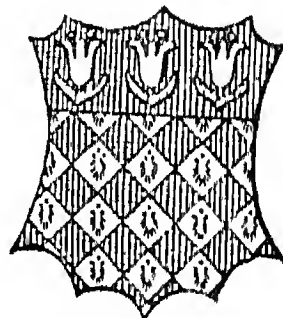


Magdalene College, Cambridge. Founded in 1542, it stands on the left bank of the river Cam

grazing and mining. The capital is Santa Marta (*q.v.*). Area, 20,827 sq. m. Pop. (1951) 457,393

Magdalena Bay. A bay of Mexico, on the Pacific coast of Lower California. It forms a magnificent harbour, about 40 m. long and 11 m. broad, and is a rendezvous of whalers and a place of naval target practice by U.S.A. warships. The bay is protected partly by Santa Margarita Island.

Magdalen College. College of Oxford university. It was founded in 1458 by William of Waynflete, bishop of Winchester, and was dedicated to S. Mary Magdalen. It was for a president, 40 fellows, and 30 scholars, who are called demies. The college is one of the



Magdalen College, Oxford, arms

richest and most celebrated in the university. It stands at the E. end of the High Street, and has a deer park and extensive grounds along the Cherwell, including Addison's Walk. The range of buildings includes the tower, on the top of which a Latin hymn is sung at sunrise on May Day; it is an Oxford landmark, and the chapel is famous for the beauty of the choral services. Among Magdalen men were Wolsey, Pole, Hampden, Addison, Gibbon, and Edward VIII. The old society of Magdalen Hall, formerly part of this college, is now Hertford College, details of which appear under that name.

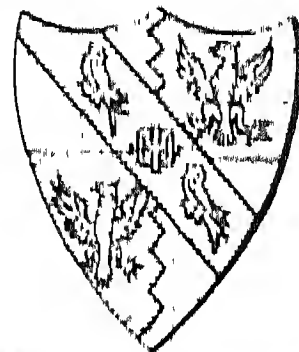


Magdalen College, Oxford. The tower, a well known landmark

The college was prominent in 1687, when the fellows refused to accept the R.C. president named by James II. There is a school for boys on the same foundation. Founded in 1480, this has modern buildings in Oxford, close to the Cherwell. The college choristers are educated

here. Magdalen College school, Brackley, is an independent offshoot of this. See Demy; Oxford, consult Magdalen College, H. A. Wilson, 1899. *Pron.* maudlen.

Magdalene College. College of Cambridge university. It originated in Buckingham College, originally a Benedictine hostel, which was named after Henry Stafford, 2nd duke of Buckingham. The college was granted by Henry VIII to Thomas, 1st Baron Audley of Walden, who by charter in 1542 refounded the hostel for a master and eight fellows under the title of the college of S. Mary Magdalene. The special treasure of the college is the Pepysian library, which contains the MS. of the famous diary. In addition to Pepys, members have included Crammer, Usher, Henry Dunster, first president of Harvard, Kingsley, Parnell, and A. C. Benson. Consult Magdalene College, E. K. Parnell, 1901. *Pron.* Mandlen. See illus. above.



Magdalene College, Cambridge, arms

Magdalenian. Late period of the upper Palaeolithic Age in Europe. In it the climate was cold, the reindeer, bison, and horse flourished, and the mammoth became extinct. The Cromagnon people, ousting the Solutrean, became modified, and prehistoric art reached its zenith. The flint industry dwindled before the apter use of bone, as in borers, barbed harpoons, spear-throwers, and whistles. Named from the rock-shelter of La Madeleine, Dordogne, the stations extend from Kent's cavern to Russia. With the dominant people may have lived a shorter one which followed the retreating reindeer eastward, carrying with them the culture, still notable for its use of bone, which is preserved among the Eskimo. After

this a transitional (Mesolithic) period led to the Neolithic age.

Magdeburg. City of E. Germany. Capital of the former Prussian prov. of Saxony, it lay after the Second Great War in the *Land of Saxony-Anhalt*. It is on the left bank of the Elbe, 80 m. S.W. of Berlin. Until 1912 a fortress, Magdeburg up to the

Magdeburg arms

Second Great War was the centre of Germany's inland water transport, one of her most important rly. junctions, and an airport of the first rank. Magdeburg is mentioned in documents as far back as A.D. 805, but it was destroyed during the Thirty Years War except for the church of Our Lady (1070, rebuilt 1220-35) with fine old cloisters, the tower of S. Peter's, one timber-frame building, and the cathedral which, first built 955, rebuilt 1209 after a great fire, and finished only 1520, had two towers 343 ft. high, and contained the tombs of Otto the Great and his wife, Edith of England, and a monument by Peter Vischer of an archbishop. A fine equestrian statue of the 13th century, of Otto, decorated the Old Market.

Magdeburg was again almost completely destroyed during the Second Great War. A huge Krupp plant, the Gruson works—Germany's chief locomotive factory—motor, engineering, and instrument plants, sugar and chocolate factories, etc., and warehouses full of the products of the rich surrounding area—grain, sugar, seeds, foodstuffs and fodder, fertiliser and fuel—made it a target for Allied air attacks, and it was captured by the U.S. 9th army April 18, 1945, only after violent street fighting. It contained many important govt. offices, banks, clerical, scientific and teaching institutions, medical, technical, commercial, engineering and craft academies, museums, libraries, two permanent theatres, learned societies, etc.

Its history goes back to Carolingian days. Under Otto I it became the missionary centre for the Slavonic peoples. It was made an archbishopric in A.D. 963. In 1320 it was granted a constitution, subsequently a model for that of many other towns; its law and legal

procedure were among Germany's earliest and most important legal codes. Accepting the Reformation as early as 1524, and a member of the Schmalkalden league, it was in consequence banned and besieged; deprived of its privileges after surrender, Magdeburg was, after successfully resisting a siege by Wallenstein in 1629, assaulted, sacked, and burned by Tilly, May 20, 1631; 30,000 inhabitants perished during that fire. In the 1648 peace Magdeburg came, as a duchy, to Brandenburg, was rebuilt as a fortress which, however, without a shot, fell to Marshal Ney, 1806, was incorporated with Jerome Bonaparte's kingdom of Westphalia, and reverted to Prussia in 1814. It prospered, especially as a port, more than 5,000 vessels using it in an annual turnover of produce of between 1,000,000 and 1,500,000 tons. Pop. (1955 est.) 261,400.

Magdeburg Hemispheres. A device invented c. 1650 by Otto von Guericke of Magdeburg for illustrating experimentally that the atmosphere exerts pressure. The apparatus comprises a pair of hemispherical cups, usually of brass or copper, having edges which fit accurately one in the other. To one of the cups is fitted a cock, and a union for attaching to a screwed nipple on an exhausting pump. The edges of the cups are coated with grease and pressed together, and after exhausting the



Magdeburg, Germany. Pre-war view across the Elbe from the citadel, looking towards the cathedral

air from the interior of the hemispheres and closing the cock, it is found that they can be parted only with considerable difficulty.

Magdhaba. Village of the Sinai peninsula, 100 m. E. of Ismailia and 20 m. S.S.E. of El Arish. In the First Great War it was a stronghold and base of the Turks in their invasion of Egypt. Bombed by British airmen in Nov., 1916, it was the scene of a Turkish defeat by Anzac troops and the Camel Corps, Dec. 23, 1916. Nearly the whole of the Turkish force was either killed or captured.

Magee, WILLIAM CONNOR (1821-91). Irish prelate. Born at Cork, Dec. 17, 1821, he was the son of a clergyman there, while his grandfather, William Magee (1766-1831) was archbishop of Dublin. Educated at Kilkenny and Trinity College, Dublin, he was ordained in 1844. Magee settled at Bath in 1848 and at the Octagon chapel made a reputation as a preacher. In 1860 he returned to Ireland as vicar of Enniskillen, and in 1864 became dean of Cork, holding also from 1866 the deanery of the



William Magee, Irish prelate

Chapel Royal, Dublin. Bishop of Peterborough from 1868, he was early in 1891 appointed archbishop of York, but died almost at once, May 5. Magee was generally

regarded as one of the finest orators of his day. *Consult* Life and Letters, J. C. MacDonnell, 1896.

Magellan, STRAIT OF. Passage connecting the Atlantic with the Pacific, near the southern extremity of S. America. It takes a tortuous course between the mainland and Tierra del Fuego. Its entrance is between Cape Virgin on the N. and Cape Espíritu Santo, a projection of Queen Catherine's Foreland on the S., and it enters the Pacific at Cape Pillar. Its extreme length is 365 m., while its width varies from 2½ m. to 17 m. The only harbour is that of Magalanes or Punta Arenas, on Brunswick Peninsula. The strait was discovered by Magellan (*q.v.*) in 1520, and was thoroughly explored in 1826-36.

Magellan, FERDINAND (c. 1480-1521). Anglicised name of the Portuguese navigator, Fernão de Magalhães. In youth he was attached to the court, and in 1504 went to India with d'Almeida, the first viceroy. After expeditions to Malacca, Java, and the Spice



Ferdinand Magellan, Portuguese seaman

Islands, he returned to Portugal in 1512 and served in a campaign in Morocco in which he was lamed for life. Discontented with his treatment by the king of Portugal, he entered the Spanish service in 1517, and two years later embarked with a fleet of five vessels

on a voyage to find a western route to the Spice Islands. Patagonia was sighted, and on Oct. 21, 1520, Magellan discovered the strait which bears his name.

The first to enter the Pacific, which he so named from the calm weather he encountered, he reached the Ladrões (otherwise the Marianne Is.), March 6, 1521, after his men had suffered terribly from scarcity and scurvy. He proceeded to visit the Philippine Islands, but in a fray with the natives of Mactán his party, attempting to convert the natives to Christianity, was beaten and Magellan was killed, April 27. After his death his fleet doubled the Cape of Good Hope and one vessel returned to Seville, having thus completed the first voyage round the world. *Consult* The First Voyage Round the World by Magellan, A. Pigafetta, Eng. trans., 1874; Life, F. H. H. Guillemard, 1890; Ferdinand Magellan, E. F. Benson, 1929.

Magellanic Clouds. In astronomy, name given to two cloud-like oval masses of thickly clustered stars and nebulae in the neighbourhood of the S. celestial pole. They are named after the navigator Magellan (*v.s.*) and resemble a portion of the Milky Way in appearance, though apparently unconnected with its structure. They are now known to be satellite galaxies of our Milky Way system. The large cloud is 14,000 light years across and 112,000 light years away; corresponding figures for the small cloud are 6,500 and 104,000.

Magendie, FRANÇOIS (1783-1855). French physiologist. Born at Bordeaux, Oct. 6, 1783, he became professor of pathology in the Collège de France, 1830. An excellent experimenter, he demonstrated the motor functions of the anterior and the sensory functions of the posterior spinal roots. He also investigated the mechanism of deglutition and vomiting, and introduced into medical practice bromine, iodine compounds, strychnine, and morphine. In 1821 he founded the Journal de Physiologie Expérimentale. He died Oct. 8, 1855. A study of Magendie by J. M. D. Olmsted appeared in 1944.

Magenta. Town of Italy. In the prov. of Milan, it stands on the Ticino, 16 m. W. of Milan. It has some small manufactures, including silks, and gives its name to a colour discovered about the time of the battle (*v.i.*), and thence to the aniline dye more correctly called fuchsine (*q.v.*). Pop. (1951) 15,382.

Magenta, BATTLE OF. Fought June 4, 1859, between the Sardinians and the French on one side and the Austrians on the other. As soon as war broke out in May, the Sardinian troops were in position north of Alessandria, waiting for their French allies coming from Genoa. At Montebello and Palestro they beat back attacks, and thereupon the Austrians took their stand behind the Ticino near Magenta. By this time the French had come up and some of them crossed the river, and for a time the battle raged without definite result. The decisive move was made by Macmahon, who, without waiting for the consent of Napoleon III, crossed the Ticino higher up and appeared on the right flank of the Austrians. The latter fell back, and the battle ended almost without any move on the part of the Sardinians. The numbers engaged were about equal, 60,000 on each



Maggiore, North Italy. The lake seen from above Stresa, looking toward Isola Bella and the Alps

side; but the Austrians lost 10,000, including a number of prisoners; the French lost about 4,000.

Magersfontein, BATTLE OF. Fought between the British and the Boers, Dec. 11, 1899. A British force about 10,000 strong, under Lord Methuen, was advancing to the relief of Kimberley. It had fought three actions within a week, losing about 1,000 men, and had forced the crossing of the Modder. It was then reinforced by the Highland brigade.

In front was a semicircle of hills, but little appears to have been known about the Boers holding them. On Sunday afternoon, Dec. 10, in heavy rain, the force moved out to the attack. The main assault was entrusted to the four regiments of the Highland brigade under Wauchope. The brigade of Guards and a brigade of English infantry were behind.

After a rest the Highlanders, the Black Watch leading, renewed the advance. It was 1 a.m., and the men were moving in close order, when the Boers suddenly opened

fire. Wauchope and some hundreds fell in a few minutes, and all was disorder. At dawn the guns got to work, while other battalions came up in support. The Boers were prevented from crossing a drift on the Modder by some cavalry and mounted infantry. The Gordon Highlanders made a fine attempt to get to the foe, and the Guards assisted in this movement, but it was impossible to secure a general advance. At nightfall the Boer guns began to play again, and Methuen withdrew his army to the Modder. The British lost nearly 1,000 men. The Boer losses were stated to be 70 killed and 250 wounded. *See* South African War.

Maggiore. Lake of N. Italy and S. Switzerland. The ancient Lacus Verbanus, it lies mainly between Piedmont and Lombardy. It is 38 m. in length, from $\frac{1}{2}$ m. to $5\frac{1}{2}$ m. in breadth; its maximum depth is 1,200 ft., and its area is 82 sq. m.,

while its surface alt. is 640 ft. Fed by the Maggia, the Tosa, or Toce, and the Ticino, which traverses it, its waters have a greenish hue at its upper end, while at the other extremity it is a deep azure. The N. arm, in the Swiss canton of Ticino, is called Lake Locarno.

and on its N. shore stands the picturesque town of Locarno (*q.v.*). Lofty mountains enclose the N. part, while to the S. the hills, covered with vineyards, slope gradually to the plain. Maggiore is noted for its beautiful scenery. Opposite Pallanza are the Borromean Isles (*q.v.*).

Maggot. Popular name for the larva of an insect, especially when white in colour and without legs. The term is not a scientific one, and has no definite limits of application. It is most commonly given to the larvae of flies, found in decaying animal and vegetable matter.

Maghara. Wadi N.W. of Jebel Serbal, near the W. Sinai coast of Egypt. A narrow valley between sandstone cliffs, its W. face is penetrated by galleries made by ancient Egyptian turquoise miners, who sculptured reliefs thereon, portraying their royal masters from the 1st dynasty down to Rameses II. From 1849 Macdonald attempted unsuccessfully to rework the mines. Petrie made a systematic examination of the remains in 1905.

Magi. Caste of learned priests in ancient Persia. An aboriginal Median tribe, they became predominant through their development of central Asian shamanism, practising exposure of the dead and next-of-kin marriage. The Rab-Mag of Jer. 39 was Nebuchadnezzar's chief magus; the contemporary Jerusalem sun-worship (Ezek. 8) attests their missionary activity, about 600 B.C., and the Behistun inscription mentions them. After their Aryan subjugation they acquired control of the Zoroastrian worship, contributing thereto its dualistic principle. They maintained their supremacy throughout the Sassanian empire, ultimately declining into unhonoured jugglers, whence the English word magic. The Magi of the Nativity story (Matt. 2) are popularly associated with much unhistoric tradition. See *Three Kings*: Simon Magus.

Magic (Gr. *magikē*, pertaining to the Magi). Practice of attempting or pretending to control events by non-rational processes. It is based on a belief that man may secure the mastery of nature and the supernatural by means of appropriate rites, manual or oral.

The psychological attitude of primitive man towards his environment, seen and unseen, is a vague complex best described as magico-religious. Even in the lowest levels of culture all beliefs, with the practices and rites that give expression to them, are not necessarily magical. They sometimes recognize, more or less consciously, dependence upon rather than mastery of the unseen, and thereby stand upon the threshold of religion. If magic be defined as the power of the spell, and religion as submission to a higher power, the distinction between the two is that between spell and prayer.

When magic is countenanced by the community at large, its professed exponents are held in esteem so long as they are thought to be working for the general good. They may rise to social eminence, as in ancient Babylonia and Egypt, and from their superior capacity may attain the supreme power. Thus Dinka chiefs owe their position to their prestige as the tribal rain-makers; when this power fails, they may be deposed. But there often arises a suspicion, if not a certainty, that magical powers are being exercised for private ends, and this aspect of them leads to their being regarded as antisocial and condemned as illicit. Hence the distinction between white and black magic, the one beneficent, the other baleful.

It would seem that in the development of magical ritual act preceded word. The efficacy of the act is usually deemed to lie in the law of association. Hence the use of such terms as sympathetic, contagious, and imitative magic, as when an Australian blackfellow induces the death of an enemy by pointing a death-bone towards him, a Basuto youth acquires courage by eating a slain warrior's heart, or a seaman raises a wind by whistling. The magic of word or name—the spell or enchantment—rests on the notion that they partake of the substance of the person or thing denoted, a mode of thought especially rife among Semitic peoples.

In its beginnings magic was a genuine effort of the human mind to solve the riddle of luck. The magician should be conceived as exerting a power, not as practising an art. This mystic power of controlling the occult is conveniently called *mana*, a Polynesian word denoting the positive aspect of magic, its negative aspect being denoted by the more familiar Polynesian word *taboo*. When this potency is conferred upon inanimate objects they become fetishes, talismans, or mascots, and amulets or defensive charms.

In the workaday world there is a large realm of empirical practice which achieves results by rational processes, such as chipping a flint or weaving a mat. These acts, therefore, are not magical, and it is out of them, not out of the magical, that science emerged. Both magic and primitive religion are primarily concerned with the crises of life, and their ritual expression is intimately associated with the events of birth, reproduction, and decay. Hence the medicine-man merges into the witch-doctor when, to his crude pharmacy and surgery, he adds such magical mysteries as the pretended exorcism of a disease-demon, or the provision of a talisman to ensure childbearing. Magical rites may also be practised, either by the community, as in the Hopi snake-dance, or by the individual magician, for compelling rain, or increasing the fertility of cattle and crops. Much magic is defensive in purpose, as when one sorcerer seeks to counteract the malignant spells of another, or an amulet is worn to avert the evil eye. While divination resembles magic in employing non-rational processes, it differs from it in that its purpose in relation to the unknown is discovery, not control.

The tendency of advancing culture has always been to discredit,

and yet to fear, those magical arts which are practised by peoples on a lower cultural plane. The Malay is convinced that the jungle-dwelling Jakun possesses mysterious powers which cannot be aroused with impunity, and the peasantry in rural Britain still seek the aid of the gypsy in the greater crises of life. Magic dominated the emotional life of early Greece, and magical arts were attributed to Hecate and her offspring, Circe and Medea. The introduction of central Asian shamanism into Persia gave rise to the priestly caste of the Magi, who ultimately degenerated into mere jugglers. They bequeathed to Europe the word magic as denoting legerdemain and other forms of visual deception, still called conjuring.

At the beginning of our era magical arts came into conflict with Christian teaching, as recorded in the N.T. They comprised a farago of beliefs affected by neoplatonism and other philosophical speculations. Introduced into W. Europe through Byzantine and Saracenic channels, they developed new methods during the Middle Ages. Their mystic apparatus of wands, rings, mirrors, diagrams, symbols, and meaningless phrases were deemed by their exponents to be endowed with a potency which irresistibly ensured the attainment of their ends. See *Obeah*; *Rain-making Customs*; *Voodoo*; *Witchcraft*.

E. G. Harmer

Bibliography. *Magic and Fetishism*, A. C. Haddon, 1906; *The Golden Bough*, J. G. Frazer, 1911; *The Threshold of Religion*, R. R. Marett, rev. ed. 1914; *Ritual of Higher Magic*, F. Morrish, 1947.

Magic Circle. A society of British conjurers, professional and amateur. It was founded in 1905 by Neil Weaver, Herbert Collings, and Ernest Adams. See *Conjuring*.

Magic Flute. Title. English title of *Die Zauberflöte*, an opera composed by Mozart, first produced under his direction in Vienna Sept. 30, 1791. Considered the greatest of Mozart's German operas, it was composed for his friend Schikaneder, manager of the Vienna theatre, who also wrote the libretto. A "fairy" opera, it combines the spectacle of a pantomime with the solemnity of ritual music, and met with instant success. It was given in England, in the original German, at Covent Garden in 1833; the first production in English was at Drury Lane in 1838. Goethe began, but did not complete, a libretto for a sequel. *Das Labyrinth*, by Winter, is a sequel.

Magic Square. Arrangement of numbers in the form of a square, which is divided on a chess-board

1	15	14	4
12	6	7	9
8	10	11	5
13	3	2	16

Magic square in which the sum of the numbers in every row, column, or diagonal is 34

Dürer's engraving of Melancholy, which is illustrated. In this the sum of the numbers in every row, every column, and each diagonal is 34.

It will be observed that the numbers used in this magic square are consecutive, and run from 1 to 16. If the integers are consecutive from 1 to n^2 the square is said to be of the n th order. In such an example the sum of the numbers in any row, column, or diagonal is equal to $\frac{1}{2}n(n^2 + 1)$. Some magic squares are of considerable antiquity, and, engraved on silver or other metal, were worn as amulets, as indeed they are in the East to this day. Emmanuel Moschopolus, who died in Italy about 1460, wrote a treatise on them, and investigated their mathematical theory, and the astrologers of his time, and afterwards, were much impressed by these arrangements, the squares of the orders 3, 4, 5, 6, 7, 8, and 9 being associated respectively with the seven astrological planets, Saturn, Jupiter, Mars, the Sun, Venus, Mercury, and the Moon. In 1705 De la Hire translated the essay of Moschopolus and collected the various known theorems on them, and gave rules for the construction of magic squares of higher order than the second.

Magilp OR MEGULP. An oil medium used by artists. It gives a smooth paint which works easily under the brush. It appears to have originated in the 17th century, is said to have been used by Claude, and certainly was by Reynolds and Wilkie. The formula varied, but it consisted essentially of mastic varnish and linseed oil or linseed oil varnish. Magilp lacks permanence and, especially if a quick drying varnish is used, cracks badly, so that its use is now condemned.

Maginn, WILLIAM (1793-1842). Irish author. Born at Cork, July 10, 1793, he was educated at Trinity College, Dublin, and 1823 went to London to pursue a liter-

ary career, contributing to Blackwood's Magazine, and to Fraser's Magazine, which he assisted in founding, and in which his Homeric Ballads appeared. His remarkable series of Shakespeare Papers, which appeared in Blackwood's during 1837, aroused considerable discussion. He contracted habits of intemperance, fell into debt, and in 1842 was imprisoned in the Fleet. He was released by the offices of Sir Robert Peel, but his shattered constitution gave way soon afterwards, and he died at Walton-on-Thames, Aug. 21. Maginn possessed a strong vein of native wit, which even in his most wretched circumstances never failed him.

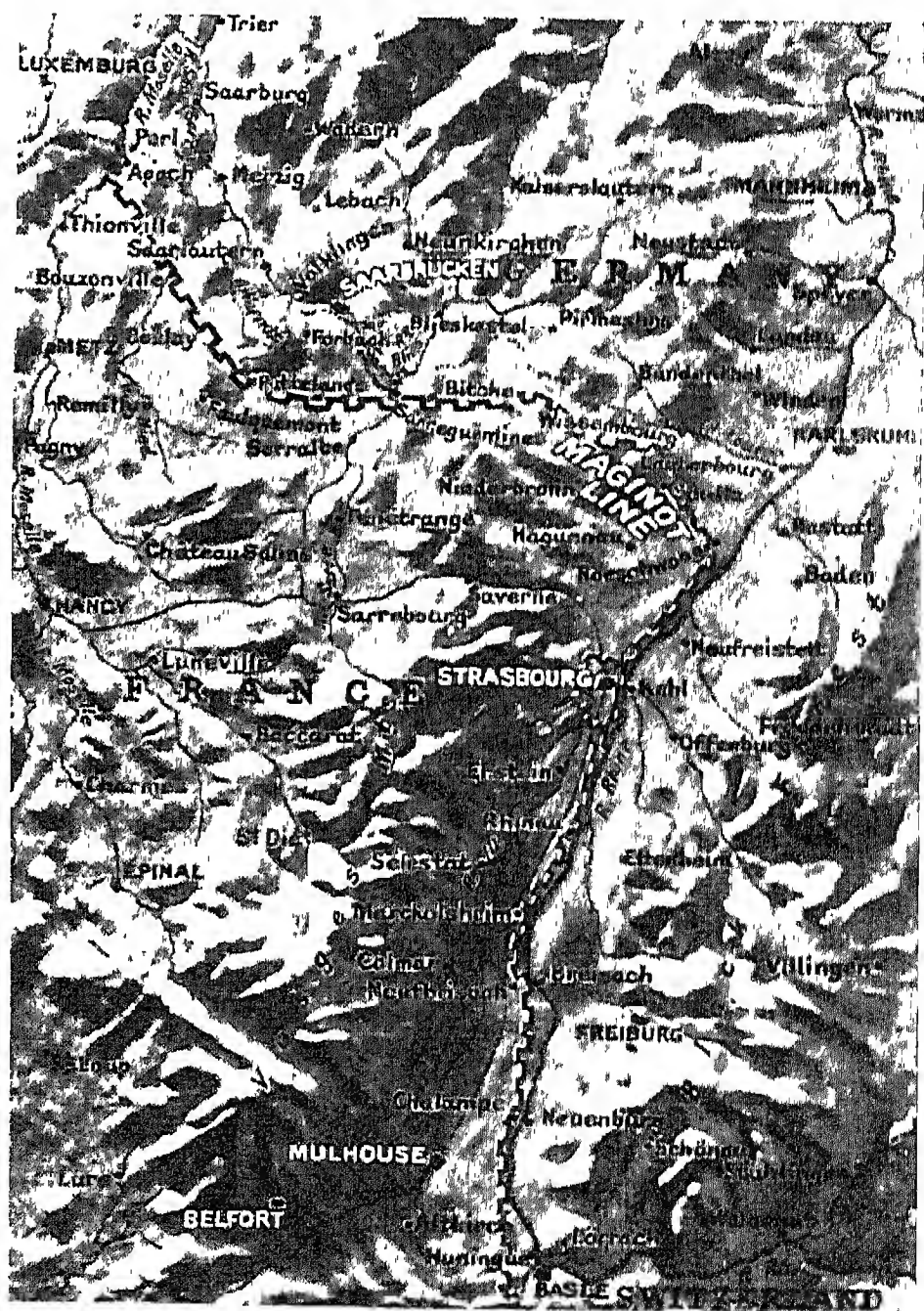
Maginot Line. A system of fortifications covering part of the frontier of France. The original defence system was begun in 1929, under the direction of Maginot, French war minister, and was completed in 1936. The fortifications extended from Montmédy to Belfort; but in 1936 it was decided to continue the line to the English Channel in the N. and to Grenoble in the S., increasing the length from 250 to 600 m. The defences on the Franco-Belgian frontier were still unfinished at the outbreak of the Second Great War, and W. of Montmédy consisted of little more than field fortifications.

Much of the Maginot line was underground, only barbed wire entanglements, tank obstacles, and some block-houses being visible. Ahead of the line itself were strongpoints intended to hold up an attacker and force him to disclose his real objective. The defenders would then fall back to the main defences through underground passages.

Minefields, tank traps, and obstacles, all covered by concealed weapons, guarded the approaches to the line. The defenders were protected against surprise by an elaborate warning

system. Big forts were nothing less than underground barracks, with living quarters, hospitals, air-conditioning apparatus, and transport systems which included electric rlys. Some passages extended 20 m. behind the line, so that the forts could be revictualled and reinforced undisturbed by the enemy.

Heavy guns were mounted in turret casemates, which were surrounded by machine-guns to prevent enemy troops from placing demolition charges against the upper works. By the use of panoramic telescopes the guns could be controlled as in a battleship. The cables of the telephone system were buried five metres (16½ ft.) deep in concrete slabs, and the exchanges were 50 metres (164 ft.) underground. Throughout the line the shelters were constructed far away from the casemates; and the underground galleries could be divided into sections by armour-plated doors. The German counterpart to the Maginot Line was the Siegfried Line (*q.v.*). By their breakthrough N. of Montmédy, the Germans outflanked the line in May, 1940, and finally took it in reverse, though in places the defences held out until the surrender of France in June. There



Maginot Line. Map of the system of fortifications covering the eastern frontier of France. It was begun 1929, under the direction of the war minister Maginot, and completed 1936, and was 250 m. in length

is little doubt that this line gave the French military leaders a false sense of security and impaired the offensive spirit of the army. The lessons of the German campaign in Poland were ignored; and the Maginot outlook was at least partly responsible for disaster. See Fortification.

Magister. In classical Rome, the name of various officials, both public and private, religious and secular. The most important were: *magister equitum* (master of the horse), the commander of the cavalry under a dictator (*q.v.*), by whom he was appointed; *magister militum* (master of soldiery), the name given after the time of Constantine the Great to the imperial generals and legates; *magister officiorum* (master of offices), chief of the civil service; *magister memoriae*, who communicated imperial decisions to the people. The name was also given to the heads of guilds, corporations, and priestly colleges, to municipal officials, to persons chosen by the creditors of an insolvent debtor to act in their interests, to the captain of a ship, and to the master of the ceremonies at a banquet. Each country village (*vicus*) and district (*pagus*) also had its magister. During the regal period the administration of the city was in the hands of a *magister urbis*.

Magistrate (Lat. *magistratus*). Official of Roman origin, mainly concerned with administering the law. In ancient Rome the magistrates during the republican period were divided into ordinary and extraordinary. The former included the consuls, censors, praetors, aediles, quaestors, tribunes of the plebs; the latter the dictator, master of horse, military tribunes with consular power.

Further distinctions were patrician magistrates, appointed after the auspices had been taken; and plebeian, appointed without auspices. The dictatorship, consulship, praetorship, and censorship were higher (*maiores*), the aedileship, quaestorship, and tribunate of the people lower (*minores*), magistracies. Curule magistrates—consuls, censors, praetors, and curule aediles—had the right to sit in a curule chair and to wear the *toga praetexta*, a white toga with purple border. Those magistrates who possessed the *imperium*—which they exercised, though with certain limitations, as the successors and representatives of the old kings—but not those who only had *potestas*, or executive powers limited to their sphere of office,

were accompanied by lictors bearing the fasces. The order of magisterial rank was dictator, consul, praetor, master of horse, censor, aedile, quaestor.

In modern usage the word magistrate is applied to a large number of people who are publicly vested with authority to administer the law. Justices of the peace are commonly called magistrates, and the head of a republic, *e.g.* the U.S.A., is known as the chief magistrate.

Magistrates' courts (formerly police courts) play a great part in the administration of criminal justice in England. The great majority of these courts consist of justices of the peace who may receive expenses but no other remuneration and who are not trained lawyers. Usually there must be at least two justices in the court, but for some purposes one justice may act. These courts issue summonses requiring accused persons or a witness to attend, or a warrant for the arrest of an accused person or of a witness who fails to attend. They also try all criminal cases arising in their district except the more serious and these they send for trial at quarter sessions or assizes if they decide there is some evidence against the accused.

Magistrates' courts have also jurisdiction in some civil matters, *e.g.* affiliation cases; domestic proceedings between husband and wife; applications for consent to the marriage of persons under 21.

In London outside the City and in a few provincial courts, the magistrates are paid lawyers called stipendiaries. (In the City of London the lord mayor and aldermen sit at the Mansion House and the Guildhall.) Any one of these persons may sit alone.

Magma. In geology, term given to the molten or potentially fluid material from which igneous rocks (lavas, etc.) are derived. Magma differs from lava in that it contains dissolved gases and other volatile constituents which escape from the fluid when it solidifies or when it comes to the earth's surface and the pressure due to the load of overlying rocks is absent.

Magmas vary widely in chemical composition. Rocks derived from them show even wider variations, because as cooling progresses the magmatic fluid changes in composition as different minerals crystallise in turn, or as country rock is assimilated into it. The conditions under which magmas consolidate control the degree of crystallisation of the rock pro-

duct. Slow cooling at depth promotes complete crystallisation of the constituent minerals. This drives out the volatiles, which in consequence permeate the surrounding country rock, altering or metamorphosing them, and in places forming ore deposits. See Igneous Rocks; Lava; Metamorphism; Plutonic Rocks; Volcano.

Magmatic Segregations. Type of mineral deposit. They are formed by concentrating processes operating within a molten rock magma before appreciable crystallisation has taken place. Important deposits have been formed in this way, but the numbers are small compared with those arising out of later hydro-thermal activity (*see* Hydrothermal Deposits). Typical magmatic segregations include certain magnetite, chromite, and sulphide ore bodies. The enormous mass of magnetite at Kiruna in Sweden forms an entire hill-ridge and is considered to represent a segregation of solid magnetite that has been remelted and squeezed out into adjoining rock to form a solid dyke of iron ore. The magnetite crystallised early and sank to the bottom of the magma chamber. Similar gravity concentrations of early chromite crystallisations are found in Norway and elsewhere. Sulphide segregations (*e.g.* at Sudbury, Ont.) are slightly different; here the concentration was effected by the separation of a heavy sulphide melt which became immiscible with the parent magma and sank to the bottom.

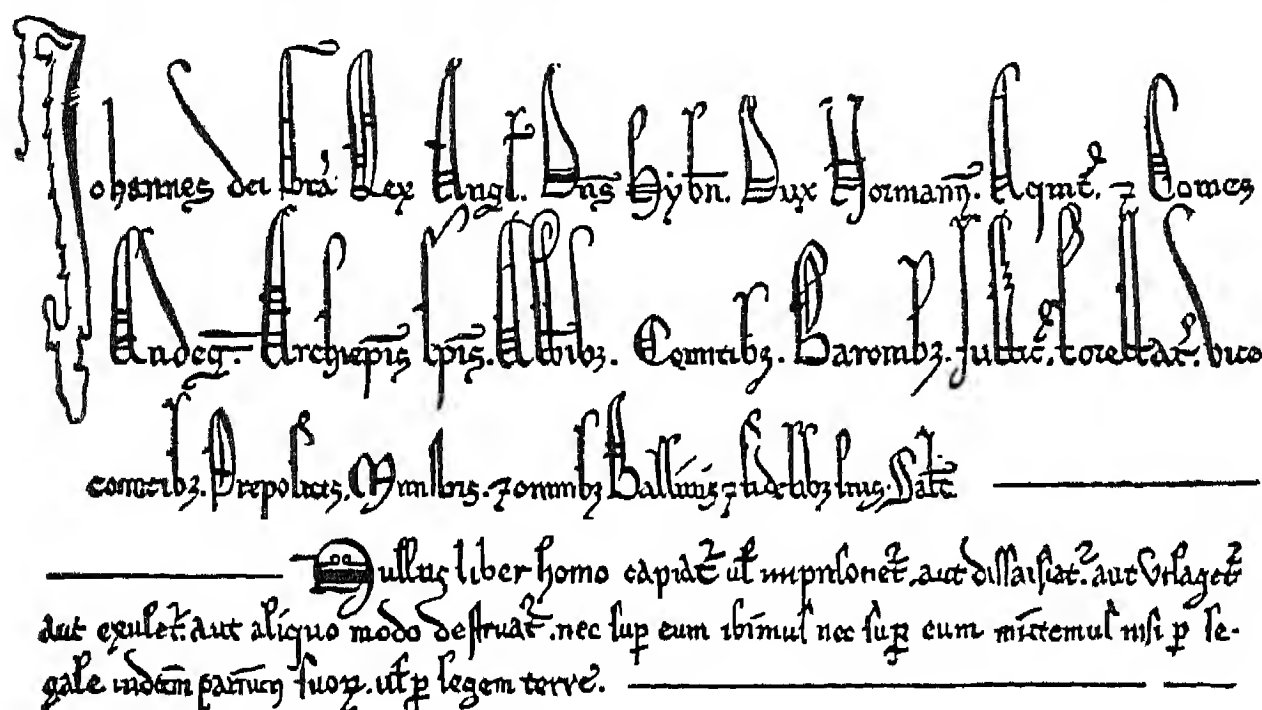
Magna Carta (Lat., great charter). A document sealed by King John of England in 1215, securing national liberties. The misgovernment of John (*q.v.*) had become intolerable, alike to the barons, the clergy, and the commons of England. He had overriden or sought to override all law, and in Jan., 1215, the barons demanded the confirmation of the old charter issued by Henry I, a charter promising to observe "the good laws of Edward the Confessor." It became evident that John intended to resist by force—also that he had not force enough. The barons, largely guided by the archbishop, Stephen Langton, who officially conducted negotiations on the king's behalf, revised their terms in a more stringent sense; and the king found himself compelled to accept them and to set his seal to the Great Charter on June 15, at Runnymede, near Staines.

Except for the one section providing for the immediate control of

the government, the "palladium of English liberties" aimed not at all at the making of revolutionary changes. It stated what Langton and the barons took to be the recognized and fundamental principles for the governance of the realm in accordance with old-established law and custom; it required king and barons alike to bind themselves to observe those laws and customs; it claimed that

lent to the U.S.A. for exhibition at the New York fair in 1939, and was retained in America, because of the hazards of returning it under war conditions, until 1946. *Magna Carta*, W. S. McKechnie, 1905, remains the authoritative study.

Magna Graecia (Lat., great Greece). Collective name given to the ancient Greek colonies in the S. of Italy, the chief being Tarentum, Croton, Sybaris, Rhegium,



Magna Carta. Facsimiles showing, top, three lines of the preamble and beneath them three of the 39th chapter, which guaranteed trial by jury

neither in the crown nor anywhere else did there lie any power or right to override them or to change them except with the common consent; and it asserted the right of resistance in arms to such attempt to override or change them.

It laid down the principles that no man may be punished without fair trial; that punishment must be proportionate to the offence, and that justice may not be denied nor delayed, nor sold to any man. It affirmed, as generally recognized, certain feudal rights of lords over their vassals, and it claimed that demands beyond these might not be made without the sanction of the great council of the realm, duly summoned according to recognized form. This clause became the basis of the doctrine that the crown cannot impose additional taxation without the assent of parliament.

The British Museum possesses the original Articles of the Barons and two of the four surviving originals of the *Magna Carta* of 1215, the two others being at Lincoln and Salisbury. The Lacock abbey copy of Henry III's third reissue of *Magna Carta*, 1225, i.e. the final form as still in the statute book, was presented to the museum in 1945, and is an extremely beautiful document, with a nearly complete impression of the first great seal of Henry. The Lincoln copy of *Magna Carta* was

and Metapontum. The original colonies were mostly founded c.720–650 B.C., rose to great power and wealth, warred with each other and with the natives, and were decadent long before the Roman conquest in 271 B.C.

Magnesia. Two ancient cities of Asia Minor. (1) *Magnesia ad Maeandrum* (near mod. Ortaklar), a city of Ionia at the confluence of the Lethaeus and Maeander, is said to have been founded by the Magnetes from Thessaly, destroyed by the Cimmerians c. 652 B.C., and rebuilt by the Milesians. It was specially famed for a temple of Artemis, of which there are considerable remains, and also of a theatre and gymnasium. (2) *Magnesia ad Sipylum* (mod. Manissa) was a city of Lydia, on the N.W. of Mt. Sipylus. Here Lucius Scipio Asiaticus defeated Antiochus the Great, 190 B.C., and put an end to Seleucid domination of Asia Minor. A few miles to the E. of the city is the so-called rock of Niobe (*q.v.*), which, however, probably represents Cybele, mother of the gods.

Magnesia was also the name of a peninsula and district on the E. of Thessaly. *Magnesite* is found in Euboea opposite here in great quantities, whence the English word *magnet* (lit., *Magnesian stone*). The word *magnesia*, its corruption *manganese*, and the derivatives *magnesite*, *magnesium*, *magnetite* are of similar origin.

Magnesia. Oxide of magnesium, MgO . The name is also applied to the carbonate known commercially as *magnesia alba*. The oxide is produced when magnesium is burnt in air, but is usually prepared by heating magnesium carbonate. It is a white, light, amorphous powder used in the manufacture of firebricks, crucibles, etc., and in the manufacture of certain forms of limelight. It is also used in medicine as a laxative.

Magnesian Limestone Series.

In geology, a group of limestones of Permian age (*q.v.*) in which magnesium carbonate is present in greater or less degree. The series occurs in G.B. as a well marked band running roughly N. and S. from Durham to Derbyshire, on the E. side of the Pennines. The rock, variable in quality, is quarried for building stone.

Magnesite (Lat. *Magnesia*, a place name). Mineral consisting of magnesium carbonate, constituting an important ore-mineral of magnesium. It may occur as rhombohedral crystals resembling calcite, or compact and amorphous, and varies in colour from white to yellow-brown. It is found in veins or irregular shaped masses in magnesium-rich rocks, such as serpentine or dolomite; also in hydrothermal veins. The most important known deposits are in the U.S.S.R., Austria, Manchuria, the U.S.A. A source of magnesium, *magnesite* is also used in making refractory bricks for special linings in certain metallurgical processes. Special plastic, quick-setting cements are made from prepared *magnesite* and magnesium chloride. Crude *magnesite* is the base for many magnesium salts, including Epsom salts. See *Magnesium*; *Magnesium Ores*.

Magnesium (Lat. *Magnesia*, a place name). Metallic element notable for its lightness. The metal was first isolated by Davy in 1808. Later Bussy and Bunsen obtained reasonable quantities by reduction of magnesium chloride with potassium, but for many years its only use as a metal was for photographic work, where the intense light emitted by the burning ribbon was, and still is to some extent, used for taking indoor photographs. From 1908 the Germans developed the magnesium-rich alloys, which since 1920 have taken a world-wide and important place in industry. The element, symbol *Mg*, falls in the second group of the Periodic Table, having two free valency electrons, as do beryllium, calcium, strontium,

barium, and radium. It has an atomic number of 12; atomic weight, 24.32; melting point, 649° C.; boiling point, 1,107° C.; specific gravity, 1.74; electrical conductivity, 37 (silver being 100); crystal form, close-packed hexagonal, with lattice constants $a=3.2030$ and $c=5.2002$ at 25° C.

Extraction Processes

Magnesium occurs in nature as the carbonate, magnesite MgCO_3 , and as the double carbonate with calcium, dolomite $\text{MgCO}_3 \cdot \text{CaCO}_3$. Other less used sources are carnallite $\text{KCl} \cdot \text{MgCl}_2 \cdot 6\text{H}_2\text{O}$, Epsom salt $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$, and the silicates, olivine and serpentine. An important source of magnesium, accounting for nearly a third of the world's output, is natural brines and sea water (containing one part of magnesium in 8,000 parts of water), where it occurs as the double chloride with potassium. There are two chief types of process for the extraction of the metal, although each has several variations. The older process involves the electrolysis of a bath of fused magnesium chloride or carnallite. In the U.S.A. magnesium hydroxide is precipitated from sea water by an emulsion of lime. After filtration, the hydroxide is converted back to the chloride by the action of chlorine, which is itself obtained as a by-product from the electrolysis process which follows. During electrolysis of the fused salt, chlorine is liberated at the anode, and molten magnesium at the cathode, where it floats to the surface and is periodically dipped out. The electrolyte, which must be kept heavier than the molten metal, is not pure magnesium chloride, which has a high melting point of 712° C. and a low electrical conductivity, but a mixture with other chlorides such as those of calcium and sodium.

Later processes are essentially thermal reductions, one group using carbon as the reducing agent and the other silicon. The carbon reduction process was developed at Radentheim in Austria, and was later carried out in the U.S.A. and Wales. A mixture of calcined magnesite and powdered coal or coke is fed continuously into an electric arc furnace. The resulting reaction produces gaseous magnesium and carbon monoxide, and the metal is chilled rapidly by fuel oil before it has time to reoxidise and form magnesium oxide. The oil prevents the fine magnesium powder from igniting spontaneously in the air and makes it safe to handle.

The silicon reduction process was devised by Pidgeon in the U.S.A. and involves the direct reduction of the magnesium present in dolomite by powdered ferro-silicon. The calcined dolomite is mixed with the ferro-silicon, pressed into pellets, and heated under vacuum at 1,200° C. in a retort. The magnesium is evolved as a vapour and crystallises in the cool end of the retort, leaving a residue of calcium silicate in the hot end. The commercial metal has a purity of at least 99.8 p.c., while that produced by the thermal reduction processes exceeds 99.98 p.c. magnesium.

Metal from the electrolytic process is often purified by remelting under a suitable flux, heating to 740° C., and adding up to one p.c. of manganese in some form or other. The melt is then allowed to cool about 70° C., when an iron-manganese complex solidifies and settles out, leaving a purer magnesium, which can be pumped off from the top. Anglo-American capacity to produce magnesium grew from 6,000 to 300,000 long tons per annum over a period of four years. Pure magnesium, which is a hard, white metal, is very stable in ordinary air, but is readily attacked by air containing salt spray. It is easily die-cast and can be rolled or extruded. An extruded rod would have an ultimate tensile strength of 12 tons per sq. in. and an elongation of 4 p.c.

Incendiaries and Signals

Magnesium alloys came into prominence during the Spanish civil war, when incendiary bombs dropped from German aircraft were of devastating effect. When the Second Great War started, magnesium production was increased for use in incendiaries, which absorbed more than half of the combined U.S.A.-British production, while magnesium continued to be used for flares, signals, flash bombs, and other applications where the vivid light from the powder was of value. At the same time the use of magnesium-rich alloys for engineering materials steadily increased.

Magnesium, which is only two-thirds of the weight of aluminium bulk for bulk, is not much used by itself as it is not very strong, not malleable at room temperatures, is brittle and easily corroded except by alkalis. But by alloying it with up to 12 p.c. of manganese, aluminium, and zinc in varying proportions, a series of alloys can be produced in cast or wrought form. These are much used for engine parts in aircraft and automo-

biles, particularly for heavy lorries, where their lightness and high strength are an asset. An alloy containing 8.5 p.c. aluminium, 3.5 p.c. zinc, and 0.5 p.c. manganese would have an ultimate tensile strength of 10 tons per sq. in. as cast, with an elongation between 2 and 8 p.c. and a Brinell hardness of 50 to 60; if this alloy is heat-treated by holding it at 370–450° C. for several hours, the tensile strength increases to 13 to 16 tons per sq. in. with an elongation of 6 to 14 p.c.

Other Magnesium Alloys

An alloy containing 0.2 p.c. aluminium, 0.2 p.c. zinc, 2.5 p.c. manganese, 0.2 p.c. copper, and 0.4 p.c. silicon, may be rolled into sheets, when it will have a tensile strength between 11 and 15 tons per sq. in. with an elongation of 4–10 p.c. Such a material might be used for fabrication of fuel tanks, as it could be readily welded by the argon-arc or a gas-welding process (*see* Welding). An alloy suitable for forging contains 11 p.c. aluminium, 2 p.c. zinc, 1 p.c. manganese, 0.4 p.c. copper, and 0.3 p.c. silicon, and has a tensile strength of 17–24 tons per sq. in. and an elongation of 5–12 p.c.

Molten magnesium burns unless protected by a flux of magnesium chloride, fluorspar, and magnesia. As it reacts violently to water, sand moulds are made containing a small amount of sulphur, which burns to form SO_2 and so protects the magnesium. Various methods of protecting the alloys from corrosion have been devised, the most important being chromating, which involves treatment with alkali chromates or dichromates. The treated surface is a good base for varnishes or paints. Many aluminium alloys contain from 3–10 p.c. of magnesium. Magnesium wire is used for degassing radio valves, magnesium ribbon as an insulator in certain heating appliances. Magnesium is used as a deoxidiser in nickel alloys, copper, and brass. *See* Aircraft; Alloys; Aluminium; Metallurgy; Welding.

Magnesium Ores. Minerals worked for magnesium. These are numerous and occur in a variety of ways. Magnesite (*q.v.*), the carbonate, occurs in two commercial forms: as compact masses and veins in serpentine formed by the action of carbonated waters, *e.g.* in Greece; and as crystalline, or spathic, magnesite, in replacement ore-bodies in dolomite or limestone, resulting from the activity of ascending thermal solutions emanating from a deep igneous

source. There are large deposits of this type in the Urals, R.S.F.S.R.; Manchuria, China; Central Europe; the U.S.A.; and Canada. Dolomite (*q.v.*) is extensively used for refractory work, and most countries have abundant supplies.

Germany used to produce large quantities of magnesium metal from carnallite, magnesium chloride, occurring in the famous Stassfurt salt deposits. Much of the American supply comes from magnesium chloride occurring in deep saline wells or is extracted from sea-water by a secret process. Brucite, hydrated magnesium oxide, is used in Canada and elsewhere, and is ideal for refractory and ceramic work.

Apart from the application of magnesia in special refractories and ceramics, magnesium and magnesium salts have numerous uses in paper manufacture, as a filler; in fertilisers; in glazes; in medicine (*e.g.* Epsom salt); as a source of carbon dioxide; and in sugar refining.

Magnetism. Physical phenomenon, known to early Greek and Chinese philosophers from the behaviour of lodestone, a mixture of iron oxides which attracts small pieces of iron and shows a preference for one particular orientation in space. The Greek name for lodestone was *lithos magnetes*, said to be derived from Magnesia in Asia Minor where it was found.

Early knowledge was summed up by William Gilbert of Colchester in his book *De Magnete*, 1600. This described methods of magnetising iron rods by stroking them with lodestone or by laying them north and south and hammering them. It also suggested that the earth itself is a spherical magnet. After the publication of Newton's theory of gravitation it came to be suspected that the attractive force of magnetism might also conform to an inverse square law. This was first accurately demonstrated by Coulomb in 1785. It led to the definition of a unit of pole strength as the strength of a magnetic pole which would repel a similar pole placed at a distance of one cm. with a force of one dyne. Subsequently Gauss (1777–1855) worked out the mathematical consequences of the fact that all actual magnets have two equal and opposite poles (north-seeking and south-seeking) at a finite distance apart. The discovery by Oersted (1777–1851) that an electric current produces a magnetic field came in 1820, and was followed eleven years later by

Faraday's demonstration that a changing magnetic field produces an electric current.

Faraday's theories of magnetism were based on the conception of a magnetic field traversed by lines of force which map the paths a north-seeking pole would follow if free to move under the influence of the field. Each line of force



Fig. 1

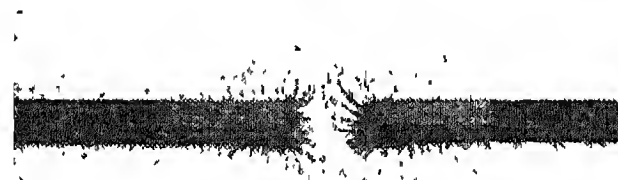


Fig. 2

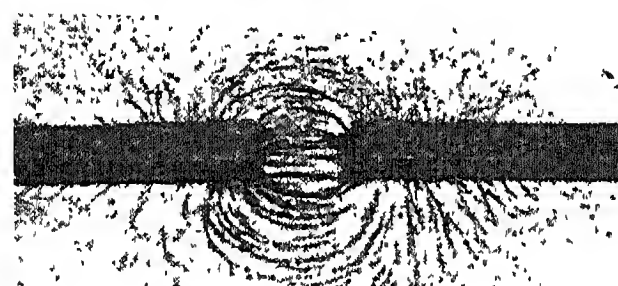


Fig. 3

Magnetism. Iron filings showing the direction of lines of force in the neighbourhood of a bar magnet (Fig. 1); two unlike poles (Fig. 2); and two like poles (Fig. 3)

begins at a north-seeking, and ends at a south-seeking, magnetic pole; each tends to contract in length, and at the same time to repel its neighbours laterally.

Lines of force tend to crowd together (representing a stronger field) in certain materials—very noticeably in iron, cobalt, and nickel (ferromagnetics); to a slight extent in most other metals (paramagnetics). These materials are said to have a higher magnetic permeability than air or a vacuum. Other substances (diamagnetics), *e.g.* bismuth, hydrogen, the inert gases, have a lower permeability than air or a vacuum, and lines of force tend to avoid them.

Faraday's mechanism of lines of force served to explain most of the effects due to the interaction of magnetic poles and electric currents. It was translated into purely mathematical terms by Clerk Maxwell, and this led to the prediction of electromagnetic waves, and recognition of light as an electromagnetic phenomenon.

By giving a quantitative definition to lines of force, Faraday was able to define the magnetic flux as equal to the total number of lines of force; the flux density (or mag-

netic induction) as the number passing (perpendicularly) through unit area; the field strength or magnetising force as the force acting on a unit pole at any given point; and the permeability of a medium as the ratio of flux density to magnetising force. In the electromagnetic system of units, a unit pole produces a flux density of 1 gauss at a distance of 1 cm. One gauss is equivalent to a flux of 1 maxwell per sq. cm., so that the total flux from a unit pole is 4π maxwell. The corresponding m.k.s. units are the weber, equal to 10^8 maxwell, and the weber per sq. metre, equal to 10^4 gauss.

The moment of a magnet is the pole strength multiplied by the distance between the poles. The intensity of magnetisation (measured in gauss) is the moment per unit volume: in a long uniform bar magnet this will be approximately equal to the pole strength per unit area of cross section. The susceptibility of a substance is the ratio of the intensity of magnetisation to the field strength producing it. Diamagnetic materials have negative susceptibility.

The work done in transporting a unit north-seeking pole from one point to another in a magnetic field represents the difference in magnetic potential between the two points, and the work done in transporting a unit north pole round a closed line of force (such as can be found surrounding conductors carrying electric currents) is the magnetomotive force. The electromagnetic unit of magnetomotive force is the gilbert, one oersted being equal to one gilbert per cm.

Some modern authorities object to the conception of the magnetic pole as purely fictitious, and prefer to define *e.g.* field strength, flux, intensity of magnetisation, etc., in terms of electrical currents rather than of permanent magnets.

Modern theories of magnetic materials are based on the assumption that the revolution of electrons in their orbits, and the individual spin of electrons, give rise to magnetic properties in atoms and molecules. Diamagnetism is the result of a tendency for the electronic orbits to precess in a magnetic field, and so to set up a force in opposition to the field. This tendency is present in all substances, but is observable as a negative susceptibility only where the magnetic moments due to individual electrons cancel each other out in the molecule. In some substances, however, a net

molecular moment remains; and when these substances are placed in a magnetic field the individual molecules tend to align themselves with the field, and so to produce a paramagnetic effect which masks the fundamental diamagnetism. In a few substances the molecular dipoles are already spontaneously aligned within small regions called domains; the effect of a magnetic field is then to align the domains, which results in the much higher susceptibilities characteristic of ferromagnetism.

When a piece of iron is hammered, the domains are mechanically jolted and realignment may be facilitated. Hence the tendency of ships' irons to become magnetised during construction in the earth's magnetic field. The increased vibration of molecules with increased temperature tends to lower magnetic properties which depend on molecular alignment. Thus, paramagnetic susceptibilities are (approximately) inversely proportional to the square of the absolute temperature. There is a group of strongly paramagnetic materials called "ferromagnetics." These consist chiefly of the metals iron, nickel, and cobalt, and alloys of these. Magnetically, they are characterised by the development of a high degree of magnetisation in relatively weak fields. It does not follow, however, that the individual atoms of ferromagnetic materials differ widely in their magnetic properties from those of ordinary paramagnetic substances. In fact, the magneton values of ferromagnetic materials, when calculated for high temperatures from their Curie constants and for low temperatures by an appropriate equation, are of approximately the same order as those of ordinary paramagnetic materials.

All important ferromagnetic alloys used for industrial applications are based on iron or nickel or both. This is because cobalt is expensive and can be successfully worked only in small quantities, while gadolinium, the only other ferromagnetic metal, is markedly magnetic only at low temperatures, *e.g.* below Curie temperature 16°C . The Curie point above which ferromagnetic properties disappear entirely are: iron, 770°C .; nickel, 360°C .

The special properties of ferromagnetic materials, which make them particularly useful for delicate recording and measuring instruments and for telecommunication equipment, are not fully understood. They are thought to

be due to the formation of spontaneously magnetised domains, which are attributed to the existence of powerful quantum-mechanical exchange forces between electrons in neighbouring atoms.

Permanent Magnets

For making permanent magnets, it is important that the domains maintain their alignment after the magnetising force has been withdrawn. This property is called remanence (or retentivity) and is measured in gauss. The chief use of permanent magnets is as needles in compasses and electrical measuring instruments; but large ones are required to provide the permanent field in measuring instruments, for adjusting ships' compasses, and for magnetos, loudspeakers, etc. Before 1880 permanent magnets were always made of hard carbon steel; since then tungsten, nickel, and chrome steels have been used, and a number of hard magnetic alloys containing also small quantities of such metals as aluminium, molybdenum, vanadium, titanium, and copper. Generally speaking, a crystal structure with high lattice strain is necessary for high remanence; and weak permanent magnets can be made even from alloys of non-magnetic metals, *e.g.* the Heusler alloys (copper-manganese-aluminium, or copper-manganese-tin).

Most of the large magnets in practical use, however, are electromagnets. Besides their use in electric motors and generators, electromagnets are used to lift scrap iron, to remove impurities from liquids (*e.g.* iron oxides from potter's clay), to operate brakes, switches, and relays, to direct streams of electrons in electron microscopes, oscilloscopes, television tubes, etc., and in cyclotrons, synchrotrons, and other particle accelerators. For the core of an electromagnet, a high permeability is required, together with a high flux density at saturation, and a low coercivity or resistance to demagnetisation. The earlier materials used were soft iron and mild steel, with permeabilities in the neighbourhood of 250. Alloys of iron with nickel, cobalt, and other metals have been produced with permeabilities as high as 100,000 and very low coercivity.

In the alternating fields produced by high-frequency currents, the magnetisation and demagnetisation tend to lag behind the field producing it—a phenomenon called hysteresis. The energy absorbed in the process appears as

heat; and both the power loss and the heat produced are increased by the effects of eddy currents induced in the material itself by the rapidly changing magnetic fields. To minimise this, large electromagnets are usually built up from thin plates insulated from each other with varnish.

All materials, but particularly ferromagnetics, suffer a slight change of dimensions when subjected to a magnetic field. Usually an expansion in the direction of the field is balanced by a contraction across it and *vice versa*, so that the total change of volume is very small. Conversely, mechanical stress will produce a slight change in magnetic properties. Both these effects come under the name of magnetostriction. Rods or rings of nickel-iron wound with coils are used as an alternative to piezo-electric crystals to produce controlled high-frequency oscillations. The coil is energised by alternating current at the same frequency as the natural vibrations of the rod or ring, and the resulting resonance greatly increases the amplitude of the oscillations. Magnetostriction oscillators provide standard sources of the ultrasonic vibrations which have many practical and scientific applications. See Ultrasonics.

At very low temperatures some metals become perfectly diamagnetic—*i.e.* no magnetic flux can enter them. A hollow sphere of such metal cooled below its transition temperature will trap magnetic flux inside; and a small bar magnet placed over a flat surface of the metal will float above it without touching, repelled by its own magnetic image. At the same time, the metal becomes a superconductor, *i.e.*, its electrical resistance becomes zero. The metals concerned occupy two blocks in the periodic table, one including titanium, tantalum, and adjacent elements, the other including aluminium, zinc, mercury, lead, tin, and gallium. Transition temperatures range from 9.22°K . (niobium) to 0.35°K . (hafnium).

The magnetic properties of certain paramagnetic salts, *e.g.* iron, aluminium, alum, are used to reach temperatures below 1°K . The principle is to align the molecules of the salt in a strong magnetic field, reduce it to about 1°K . with liquid helium boiling under reduced pressure, and then remove the magnetic field. The return of the molecules to a random arrangement removes energy from neighbouring substances, and produces

temperatures down to 0.01°K . Efforts to reach still lower temperatures depend on a similar use of the much smaller magnetic moments associated with nuclear (as distinct from electronic) spins.

TERRESTRIAL MAGNETISM. The discovery that the earth had a field with the directive property of a magnet is veiled in the mists of antiquity. The earliest reliable evidence dates from the 11th century A.D. and is credited to the Chinese encyclopedist Shon-Kua: "Fortune tellers rub the point of a needle with the stone of the magnet in order to make it properly indicate the south." The use of this property, in the form of the mariner's compass, appears to have been first made in W. Europe c. 1187. It has now been reasonably established that an easterly declination had been observed in N.W. Europe some years before Columbus's voyage to the W. Indies. From experiments on the distribution of the direction of the magnetic force over the surface of a spherical piece of lodestone, William Gilbert of Colchester concluded that the earth itself must be a magnet, a hypothesis in direct contradiction to that of his contemporaries who maintained that compass needles were directed by the pole star. Later, Faraday introduced the conception of lines of force. It remained for Gauss to determine, early in the 19th cent., the type of field that most closely agrees with the actual one of the earth and to show how it could be expressed in mathematical terms.

The earth has been described as a huge but comparatively feeble magnet, the field of which extends far out into space and whose intensity weakens in proportion to the cube of the distance from the centre of the earth, *i.e.* it decreases by about 8 p.c. for every 100 m. Thus the magnetic field 4,000 m. overhead is still one-eighth as intense as that near the surface. Direct verification has yet to be made, but observations on the reception of radio waves reflected from the upper atmosphere bear out this theory.

As the earth's outer shell is not homogeneous, its magnetic behaviour is far from uniform; the distribution of magnetic forces near its surface may be regarded as consisting of the regular field, due to a uniformly magnetised sphere, with an irregular one superimposed upon it. The N. and S. magnetic poles are roughly 1,000 m. from the respective geographic ones (*see* Magnetic Poles). It follows that

the magnetic axis is inclined at some 10° or 12° to the axis of rotation and, as the magnetic poles are not diametrically opposite each other, the straight line joining them passes about 750 m. from the geographic centre of the earth.

The magnetic field may therefore be pictured as innumerable lines of force parallel to the surface near the equator, bending and converging at the magnetic poles, where a freely suspended magnetic needle would point vertically because the horizontal component possesses zero value. The vertical component is usually denoted by *Z*; the horizontal by *H*; the declination, or variation as sailors term it, by *D*; the dip, or angle which the needle makes with the horizontal, by *I*; and the resultant total force by *F*. If the field were entirely regular over the surface of the earth equal values of these elements, excepting *D*, would be found around any circle of magnetic latitude. Irregularities, however, in some parts of the world greatly affect one or other component: *e.g.* in regions where deposits of magnetic ores occur close to the surface, the field is often so disturbed as to produce minor local poles.

Portable instruments for the accurate measurements of declination and of the horizontal and vertical forces have been used in prospecting for minerals and oil. The results of these special surveys, carried out both at the surface and in mines, are normally interpreted in conjunction with other geological and geophysical information and up-to-date magnetic charts consisting of isomagnetic lines drawn through places possessing the same value for a particular element.

Lines of equal declination, or isogonics, are especially useful to those at sea, as such world-wide maps make it possible to interpret the compass direction at any point with fair accuracy.

The earth's magnetism is constantly changing and in order to supplement the measurements made at the relatively few magnetic observatories, series of surveys are made from time to time over closer networks of sites. Expeditions have probed into the uncivilized and unpeopled areas of the globe. Since the first magnetic survey at sea in 1700, world-wide cruises have been regularly undertaken, notable being the two of the Challenger (U.K.), 1872-76, and the seven, totalling more than 250,000 miles of the Carnegie

(U.S.A.), 1909-29. An aerial survey of the north polar regions by H.M. aircraft Aries, made shortly after the Second Great War, included the charting of magnetic elements. Much valuable information relative to the earth's magnetic phenomena was gathered by expeditions working in the Antarctic during the International Geophysical Year 1957-58.

Besides short period fluctuations in magnetic intensity, the earth's field undergoes changes which, though not necessarily at a constant rate, are continued gradually over very long intervals of time. This secular variation was described by Gellibrand, in 1634, as existing in the declination at London. In 1580 a compass needle there would have pointed to a position 11° E. of true N.; in 1660, almost exactly N.; in 1750, 17° W.; in 1800, 24° W.; in 1920, 14° W.; in 1940 10° W. of N. Although the oval-shaped curve plotted from these points suggests a cyclic variation with a period of about 480 years, data from other stations indicate rather different periods; there is thus no certainty that the earth as a whole has any dominant true period; and though the positions of the magnetic poles are known to be subject to steady change, no generalisation can be made of their movement relative to the geographic poles. Secular changes of dip were noted also during the 17th century. In the case of intensity, absolute measurements of which date from 1826, the long-period changes vary in different regions of the world, but the collective evidence is suggestive of a gradual decrease.

Various theories have been advanced to account for the earth's magnetism; these include the existence of a permanently magnetised core, a system of electric currents flowing within the earth around the axis, and magnetisation caused by the earth's rotation.

The magnetic field at any place on the earth also shows a marked solar diurnal variation, which has a maximum range in summer and a minimum in winter, and a much smaller variation depending on lunar time; and the character of the traces may be quiet or disturbed. Large irregular disturbances or fluctuations (magnetic storms) tend to mask the regular quiet day changes. Magnetic storms may last for a few hours or several days and often begin abruptly. A magnetic disturbance recorded at Kew observatory on Sept. 1, 1859, is historic, for on

that occasion the solar observer Carrington noted that a bright eruption suddenly appeared on the sun's disk at approx. the same time as a disturbance on the magnetic records. The interpretation of that observation created much controversy, but it is now known that it was due to an outburst of ultra-violet radiation from the eruption area, with its almost instantaneous effect on the earth's field. Most magnetic disturbances occur some time after the solar phenomena. Disturbances are most frequent near the times of the equinox and in years of sunspot maximum; there is a tendency for recurrence at intervals of about 27 days. Magnetic storms are associated with prominent and widespread displays of aurora, the effect being most striking in the polar regions; they also produce a fading out of radio and, by causing large earth currents, interfere with telegraphic communication. Normal daily variations are primarily due to the existence of electric currents in the upper atmosphere which become very intense near the zones of maximum auroral activity during disturbances. One theory which explains the great increase in the ionisation of the upper conducting layers as being due to the emanation of radiations from the sun, is supported by studies of radio-wave propagation. See *Compass; Electricity, Atmospheric; consult also The Earth's Magnetism*, S. Chapman, 1936; *Terrestrial Magnetism and Electricity*, ed. by J. A. Fleming, 1939; *Geomagnetism*, S. Chapman and J. Bartels, 1940.

Magnetite. An ore-mineral of iron, iron oxide (Fe_3O_4), containing up to 72 p.c. of that metal. It often contains small amounts of manganese, titanium, vanadium and nickel, aluminium and chromium. A member of the spinel group, it usually occurs as hard black grains or octahedral crystals. Magnetite is strongly attracted by a magnet and occasionally shows polarity (var. lodestone).

Magnetite is one of the most abundant and widespread of oxides; found as an accessory mineral in many igneous and metamorphic rocks; in meteorites; as a product of fumarolic activity; in sulphide vein deposits formed at high temp.; and as a residual mineral in alluvial deposits. The large magnetite ore-body at Kiruna, Sweden, is considered to have been formed as a segregation from a magma, whereas the Hungarian deposits were formed by contact

metamorphism during igneous activity. There are commercial deposits in Mexico, S. Africa, India, and elsewhere. The U.S.A. possess many large bodies of magnetite ore mainly formed in connexion with magmatic processes.

Magnetite is produced synthetically, as a preliminary to the manufacture of blister copper in the converter. The converter is charged with a low grade ore, which is made into magnetite by blowing. This forms an excellent refractory protective layer in the converter, so increasing its life. See *Copper; Iron Ores*.

Magneto. Electromagnetic machine for producing high-voltage sparks for petrol engine ignition. It consists of a small permanent-magnet dynamo with two windings on the armature—the primary with a small number of turns of comparatively thick wire, and the secondary with a large number of turns of thin wire. Each has one end earthed to the frame; the other end of the primary is taken to one side of the contact breaker; the other end of the secondary to a collector ring (see diagram).

As the armature rotates, the primary winding has an E.M.F.

rotates with the armature, one point being mounted on a rocker arm which, twice per rev., strikes a stationary cam, thus opening the points suddenly. The exact instant at which the opening occurs can be advanced or retarded slightly by altering the angular position of the cam.

A distributor, in the form of a rotating brush, is geared to the armature, connecting the collector ring to the various plugs so that they fire in the correct order.

A condenser is provided, connected across the contact-breaker points, to prevent excessive burning, and there is a safety-gap on the secondary circuit so that, if the magneto is disconnected from the plugs, the high voltage can discharge through this gap, instead of breaking down the insulation on the windings. The cut-out switch shown in the diagram, when closed, short-circuits the contact breaker, thus switching off the sparking, and stopping the engine.

Another inductor type of magneto has both sets of windings stationary, the necessary movement of the field flux being produced by the rotation of an irregularly-shaped soft iron rotor which alternately bridges and opens gaps in a

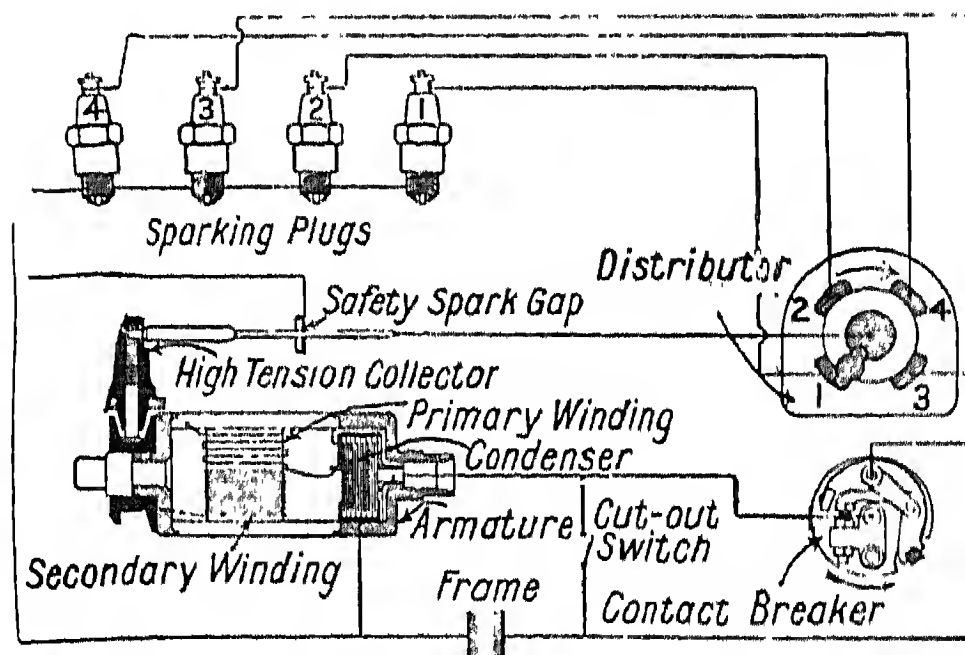
magnetic circuit, thus flicking the flux from one path to another, causing it to cut the primary winding in the process, as if the winding were rotating in a stationary magnetic field.

For automobile work, the popularity of the magneto has declined in favour of the induction coil (q.v.), which is simpler, cheaper,

and does not suffer from the disadvantage of giving a weak spark at low speeds (i.e. at starting).

Magneto-electric Machine. Machine for the generation of electricity by the rotation of a coil of wire in the field of a permanent magnet. See *Dynamo*.

Magnetograph. Instrument for obtaining continuous records of the variations of the earth's magnetic field. The pattern most widely used incorporates three magnets suspended delicately with their axes horizontal; the first lies along the magnetic meridian and indicates the declination, the



Magneto. Diagram showing the connexions of a magneto for a 4-cylinder engine. See text
By courtesy of Percival Marshall & Co.

induced in it (see *Electromagnetic Machines*) and, as it is normally short-circuited by the contact breaker points, a current flows in the primary winding. At the point of maximum intensity, the contacts open sharply, and the resulting kick, due to the collapse of the magnetic field caused by this current, induces an E.M.F. in the secondary coil which is high enough to jump the gap between the sparking plug points, and fire the charge in the cylinder.

The contact breaker consists of two points of tungsten or platinum alloy mounted on a plate which

second is transverse to the meridian and responds to the fluctuations of the horizontal component of the magnetic force, and the third, which can turn about a horizontal axis perpendicular to the meridian, oscillates in sympathy with changes in the vertical component. Each of the magnets carries a small mirror which reflects a narrow beam of light from a fixed source on to a sheet of photographically sensitive paper wrapped round a drum rotating once in 24 hrs. Spots of light similarly reflected from stationary mirrors provide base-lines which make it possible to tabulate the traces. Other forms of the magnetograph have faster-turning drums; and an arrangement of prisms may be introduced into the optical system to return the recording light spot to the chart when the deflections would normally be too great to be registered. The separate magnetic instruments of the magnetograph are referred to as variometers.

Magnetometer. Instrument for obtaining determinations of the earth's magnetic field. The elements normally measured are declination, horizontal force, and dip or downward tilt of a freely suspended magnet. Other components can be calculated from these basic measurements which serve to calibrate the base-line values of the magnetograms, thus allowing the ordinates of the traces to be expressed absolutely.

Magnetron. An instrument used in wireless engineering. The magnetron is a special type of thermionic valve in which the flow of electron current from filament to anode is controlled by a magnetic field. During the rapid development of radar, or radio-location, between 1939 and 1945, probably the greatest technical achievements were the design and production of the magnetron valve, which made it possible to reduce radar emissions from a wavelength measuring several metres to one measured in centimetres. These centimetric emissions could be projected as beams, giving greater accuracy and range. See Radar.

Magnificat (Lat., it magnifies). First word of the Latin version, and so the title, of a canticle or hymn, My soul doth magnify the Lord, in the Book of Common Prayer. In the

Anglican church it is sung after the first lesson at evening prayer, in the R.C. church at Vespers; in the Eastern church at Lauds. It is the song sung by the Virgin Mary, S. Luke 1, vv, 46-55. See Mary.

Magnification. In optics, the ratio between the apparent size of the image of an object seen through a lens, microscope, etc., and the apparent size of the object itself, seen without optical aid. It is equal to the ratio between the focal length of the objective and that of the eyepiece. It can therefore be increased indefinitely by using eyepieces of shorter and shorter focus; but though the image will thereby be magnified, it will not necessarily gain in detail. See Resolving Power.

Magnitogorsk. City of Chelyabinsk region of the R.S.F.S.R. Founded in 1931, it is on the Ural river in the Ural industrial area, and has rly. connexion with Ufa to the W., Chelyabinsk to the N.E., and Orsk to the S. It lies near deposits of iron, manganese, bauxite, and petroleum. One of the largest steel-producing centres in the U.S.S.R., it has also sulphide works and makes motor cars, tractors, and railway rolling stock. Pop. (est. 1955) 270,000.

Magnitude. In astronomy, a measure of the apparent brightness of stars. Hipparchus divided the visible range into six magnitudes. By modern measurement the earth receives from the average first magnitude star about 100 times as much light as from one just visible to the naked eye, and the scale is now defined so as to diminish the magnitude by 1 whenever the light received increases 2.512.... times. The scale extends from beyond 2.1 for the faintest known objects to negative values like -1.4 for Sirius, and -4.3 for Venus at its brightest.

Magnolia. Genus of trees and shrubs of the family Magnoliaceae, natives of sub-tropical Asia. Other species are found in the U.S.A., whence they were introduced to the U.K. in 1688. Among the two dozen species are varieties which range in height from 2 ft. to 80 ft. The large tulip-shaped flowers are of every shade from white, through pink, to purple, and there are also kinds with yellow flowers. The perfume is exquisite. The hardy kinds prefer a shady spot

in a deep, rich, loamy soil, but the half-hardy varieties require an admixture of sand and a sunny spot in the greenhouse. Magnolias are propagated either by seeds or layering. The evergreen sorts should be pruned in spring, summer leafing kinds after flowering.

Magnus (Lat. great). Masculine Christian name. It is chiefly popular in Scandinavia and is also found in those parts of Scotland in which the Scandinavians settled, e.g., the Orkneys. There is an Irish form Manus.

There have been seven kings of this name in Norway. Magnus III, king 1093-1103, married a Swedish princess, thus ending a war between those countries. He conquered the Hebrides, Orkneys, Isle of Man, and Anglesey, but was killed fighting in Ireland. He is known as Barfod or Barefoot. Magnus VI, who reigned 1263-80, is chiefly known for his laws, hence his name of the lawgiver. He restored the Hebrides to Scotland in return for an annual tribute. S. Magnus was a jarl, or earl, in the Orkneys, murdered in 1115. A number of churches are dedicated to him as S. Magnus the Martyr. See Norway.

Magnus, HEINRICH (GUSTAV (1802-70). German chemist. He was born in Berlin, May 2, 1802, and in 1831 was appointed lecturer in technology and physics at the university. In chemical research proper he discovered the acid of platino-ammonium which bears his name. An incessant worker upon electrolysis and induction of currents, he threw light on questions connected with the polarisation of heat and the expansion and absorption of gases. He died in Berlin, April 5, 1870.

Magnusson, ARNI (1663-1730). Norse scholar and historian. He was born in Iceland and educated at Copenhagen. Having published a Latin work on Icelandic history, he became in 1701 professor of history and Danish antiquities at Copenhagen. He was then commissioned to study and collect the ancient manuscripts of his native land, and there spent ten years, 1702-12, making an invaluable collection. He published Testamentum Magni-Regis Norvegiae 1719. In the great fire of Copenhagen in 1728 many of his collected manuscripts were destroyed, but the remainder he bequeathed, on his death two years later, to the university, having founded a scheme for their publication.

Mago. Name of several Carthaginian generals. The most cele-



Magnolia. Flower and leaves

brated was the youngest brother of Hannibal, who assisted in the conduct of the second Punic war in Italy, Spain, and finally in Cisalpine Gaul, where he was heavily defeated by the Roman general Varus and died of wounds, 203 B.C.

Magog. Town in the S. of Quebec, Canada. In Stanstead co., it is on Lake Memphremagog, and the river Magog, and is served by C.P.R. Factories make butter and cheese, textiles, jute products, and hardware. Pop. 9,034.

Magpie (from *Mag*, Margaret, and Lat. *pica*, magpie). Genus of birds belonging to the crow family.



Magpie. Common British species

The common magpie is a familiar resident of the British Isles. The plumage is velvet black, with green and blue reflections, with the exception of the scapulars and underparts, which are white. The tail is long and graduated, and the feet and beak are black. It was formerly very common in Great Britain, but its numbers have been much reduced by the persecution of gamekeepers; while in Ireland it was supposed to have been introduced by the English out of spite in the 17th century. An animated bird, it feeds mainly on worms, snails, and insects. Its nest is a large structure of sticks and mud, domed above, with a hole at the side for entrance. See Crow; Jay; Eggs, colour plate.

Magwe. Division, dist., and town of Burma. The division comprises the area of the Irawadi valley between the confluence of the Chindwin and the head of the delta. The dist. lies E. of the Irawadi, and is the best cultivated section of the division, although only a fifth of the total area is tilled. Oilseeds are a much more extensive crop than rice. Here also are oilfields, the installations in which were destroyed when the Japanese overran Burma in early 1942. The town is a centre for river traffic on the left bank of the Irawadi. It was recaptured by British and Punjabi troops, April 21, 1945. Div. area, 17,576 sq. m.; pop. 1,905,809. Dist. area, 3,313 sq. m.; pop. 499,000. Town pop. 7,500.

Magyar. Dominant people of Hungary. Returned in 1910 as 10,050,600, or one-half the population of the old Hungarian kingdom, they formed more than 90 p.c. of the population of the republic of Hungary created in 1918 and maintained (with minor adjustments) thereafter: in 1958 they numbered c. 9,000,000. They descend from Altaian nomads of Turkic stock and militant disposition who subdued an Ugrian people, took Ugrian wives, and adopted their language. In their westward migration from the upper Kama and Ob valleys through the Bashkir dist. between the Volga and the Urals, they halted for a time in the steppelands N. of the Caucasus, where some Indo-European contact occurred. At the end of the 9th century they crossed the Carpathians from the N.E. under Bulgar pressure, and came to a final halt in the Dacian and Pannonian plains. Here they again intermarried with those elements in the local population, formed of Avar and other ethnic remnants, which did not retreat before them into the uplands.

Aided by their conversion to Latin Christianity in the 11th century, they have more and more assimilated western culture, and have preserved their national identity from Slav absorption by the vitality of their Ugrian speech

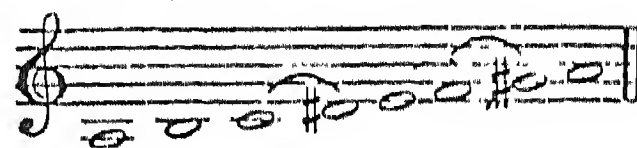


Magyar. Peasants wearing national costume

and their adhesion to the Roman communion. Their fondness for horses and flocks and their disinclination for agriculture are ancestral. They have become an urban people, muscular, broad-

shouldered, of medium stature and regular features. Two types occur, one narrow-faced and long-headed, the other broad-headed, yellowish, with brownish-black hair and wide cheek-bones, but no Mongolian strain. The isolated groups of Szeklers in Transylvania may represent the least modified ancestral type. Their speech is allied to Vogulish and Ostyakish, interpenetrated with Turkish and other kindred elements.

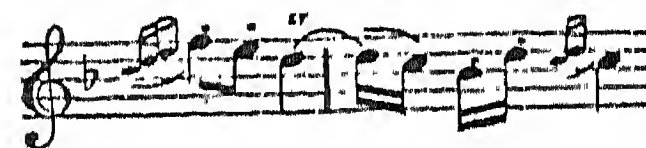
Magyar music is the national music of Hungary. It derives its most striking characteristics from Oriental and Gypsy sources. Amongst these features are (1) a scale with two augmented seconds:



(2) striking rhythms, including a rat-tat effect similar to the Scotch snap, and irregular bar-groupings:



(3) turns and embellishments of all kinds:



Much use of Magyar musical idioms has been made by Haydn, Schubert, Liszt, Brahms, Joachim, and other composers. The chief Magyar dance forms include the Czárdás, with slow and quick movements alternated; the Kör-táncz or society dance; and the Kanasztáncz, a dance of the peasantry. The Rákoczy March, as arranged by Berlioz in his setting of Faust, is the piece of music of Magyar origin which is best known in W. Europe. See Hungary.

Mahábaleshwar. Hill station of India, in Bombay state. It is 4,500 ft. above sea level among the Western Ghats, 70 m. S.E. of Bombay, and during the monsoon receives heavy rainfall. It is a resort during Sept. Oct. at the close of the monsoon. It was established in 1828, and contains the handsome Frere Hall, built in 1864. The spot is regarded with great veneration by the Hindus, as it stands at the source of the sacred river Kistna (Krishna). Distant 9 m. is the hill fort of Pratapgad, stronghold of the founder of the Mahratta empire.

Mahábalipuram. Temple site of India, on the E. coast 30 m. S. of Madras. The name is a Sanskrit form of Mammalapuram (city of

the great wrestler). Other designations are Mavalaram and the Seven Pagodas. According to tradition, five of these reputed temples are beneath the waves; the two on the shore are shrines to Vishnu and Siva.

South are several raths (see *illus.*) and other ancient monuments of archaeological interest.



Mahabalipuram, India. Monolithic rath or temple carved in granite

The faces of two huge boulders of granite, about 30 ft. high, have been magnificently carved in bas-relief for a total length of 90 ft., to represent Arjuna performing religious ceremonies. These monuments date from the 7th century, and were ordered by the Pallava kings, whose capital was at Conjeeveram. There are cave temples which today shelter Hindu pilgrims who bathe in the sea on a sacred new moon day which occurs only once in 30 years. At most seasons the sacred spot is usually deserted.

Mahabharata. Ancient epic of India. In it are related with legendary accretion the events of a great war which took place in N. India in the 2nd millennium B.C. The mass of legends and poetry concerning that time are supposed to have been put together at some unknown date into a single narrative, which continued to grow, until the complete work, as printed at Calcutta in the 19th century, contains over 180,000 lines. The story, which occupies a quarter of the whole, tells broadly of the strife of the powers of good and evil as represented by the Pandus and the Kurus respectively. The title Mahabharata signifies the epic of the Great Bharata nation. A condensation of it in English verse by R. C. Dutt was published in 1898.

Mahalla-el-Kubra. Town of Egypt. Situated on the Nile delta, it is some 60 m. S.E. of Rosetta and 70 m. N. of Cairo, and is the centre of an extensively irrigated

and fertile cotton growing district. Pop. (1955 est.) 116,000.

Mahan, ALFRED THAYER (1840-1914). American sailor and naval historian. He was born Sept. 27, 1840, at West Point, where his father was a professor in the military academy. He entered the naval academy and was engaged in blockade work during the American Civil War. In 1883 he published his first historical study, *The Gulf and Inland Waters*. That year the idea of his famous works on the influence of sea power came to him while commanding the warship *Wachusett* on the S. American coast. In 1886 he was appointed president of the U.S. naval war college. He retired from active service in 1896, but in the Spanish-American War of 1898 he was a member of the U.S. strategy board. Rear-admiral 1906, he died at Quogue, New York, Dec. 1, 1914.

Mahan published in 1890 *The Influence of Sea Power on History, 1660-1783*, which immediately made him famous, and followed this with *The Influence of Sea Power upon the French Revolution and Empire*, published in 1892. In 1911 appeared his admirable *Naval Strategy*, containing lectures delivered at the war college; and in 1913 the *Major Operations of the Navy in the American War of Independence*. His books may be said to have profoundly influenced subsequent history by turning the eyes of the great powers (other than the U.K., already aware of its importance) to the sea. His general argument was that sea power exerted such overwhelming pressure that the belligerent who did not possess it was doomed to defeat. His brilliant biographical study, *Nelson the Embodiment of the Sea Power of Great Britain*, 2 vols., 1897, developed this view.

Mahanadi OR MAHANUDDY. River of India, in the N. Deccan. It rises in the Bastar hills in the Madhya Union, flows E., and after receiving affluents from the highlands of Chota Nagpur turns S. at Sambalpur, and then S.E. to reach the Bay of Bengal by an extensive delta which is exceedingly fertile. The Brahmani and Baitarani join the delta, the head of which is at Cuttack, where a dam holds back water for irrigation. Another dam, constructed 1946-57, at Hirakud,

in Sambalpur dist., provides both power, and water for irrigation.

The upper course of the Mahanadi is deep cut in the hard rock, and during the rains the river rises rapidly and pours a great volume of water into the sea. Boat traffic stops at Sambalpur. The river pierces the line of the E. Ghats by a forested gorge, 40 m. long. Length 529 m.

Mahanandá. River of West Bengal, India. It rises in the Darjeeling dist. on the Himalayan slopes, and flows generally S. through Purnea and Malda dist. to the Ganges, near the head of the delta. Subject to freshets in its upper course, it is almost empty in the dry season near its mouth, but is navigable under favourable conditions to Kaliaganj in Purnea dist.

Mahar. Indian menial caste. Numbering over 3,000,000, mostly in W. and central India, they are descended from aboriginal elements in the pre-Aryan population of the Berar and Nagpur lowlands. Corresponding to the N. India Chamars, they retain primitive beliefs thinly veneered with Hinduism. They are scavengers, village watchmen, boundary guardians, and public messengers.

Maharaja. Indian title meaning great king. It was applied to certain powerful rajas and others of high rank. The high priests of the Vallabhacharis, a Hindu sect, call themselves maharajas. The feminine is maharani. Consult *Twilight of the Maharajas*, Sir Kenneth Fitze, 1956.

Mahasabha (Hindi *maha*, great; *sabha*, assembly). Hindi name of the parliament of the republic of India as laid down by the constitution which came into effect on Jan. 26, 1950. It consists of two houses: (1) Rajya Sabha, or Council of States, with a permitted maximum of 250 members (220 in 1957). Members are elected by the legislative assemblies of each of the states forming the union of India. The Rajya Sabha is a permanent body, one-third of its members retiring every second year. (2) Lok Sabha, or assembly of the people, is the elected body or lower house. It has a permitted maximum membership of 502 (originally 500) and lasts for five years unless dissolved earlier by order of the prime minister in council. There is a speaker and a deputy speaker. The language of debate, according to the constitution of 1950, was Hindi or English, but from 1955 it was hoped to eliminate English in all official business by 1970.



Alfred T. Mahan, American sailor

Mahatma (Skt., great soul). In India, name applied to certain men of saintly lives who have proved their purity and courage by enduring severe tests. By theosophists, it is used in a more specific sense. According to them, man has a physical, an intellectual, and a spiritual nature, and a mahatma is one who has reached perfection, his spiritual nature controlling body and intellect. M. K. Gandhi (*q.v.*), by reason of his asceticism, moral and physical courage, and spiritual ascendancy, was called mahatma.

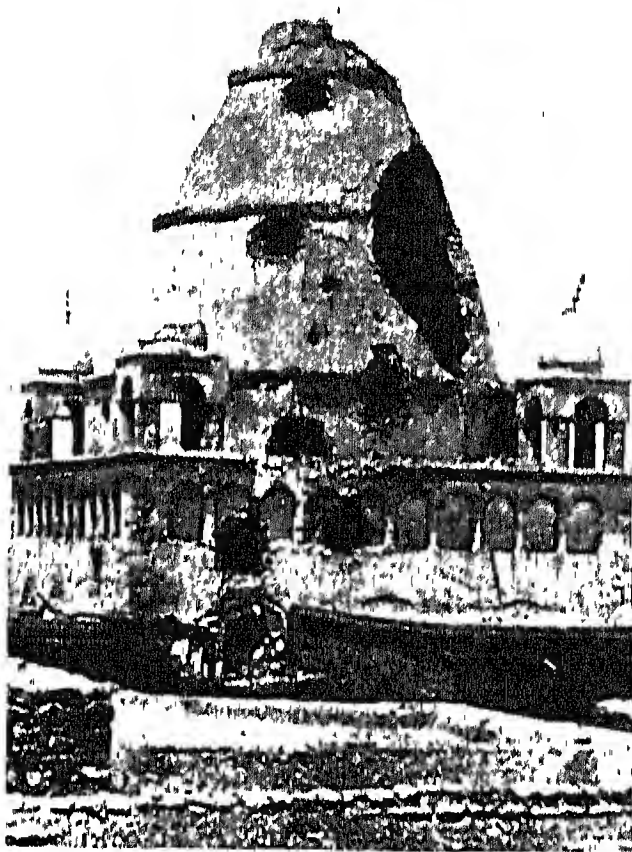
Mahāvamsa (Pali, great chronicle). Early chronicle of Ceylon, written in Pali, giving the history and traditions of the island before the 4th century A.D. It was based on a yet earlier work of the same name. An edition of the first 20 chapters was published in Ceylon in 1837 by Turnour (1799-1843); in 1844 this was issued as vol. I of the entire text and translation with an essay by Turnour on Pali Buddhistical literature, but was not completed. *Consult* ed. by W. Geiger, London, 1908.

Mahāvira (fl. c. 500 B.C.). Title (Skt., great hero) given to a wandering ascetic of the Nigantha sect, named Nāta-putta, also entitled Vaddhamāna, an Indian religious leader. A contemporary of Gautama Buddha, he taught in Bihar, and reformed the Jain religion, especially developing its metaphysical side. He ranks as 24th of the Tirthankaras or "con-

querors of self" of the present age, *i.e.* saints who have raised themselves by their austerities to superhuman rank, and are objects of worship. *See* Jainism.

Mahayana (Skt., great vehicle). Term denoting the later doctrinal

system of Buddhism. Some scholars distinguish by the term Hinayana (little vehicle) the earlier system, which was agnostic, ascetic, and egoistic, seeking personal salvation through the attainment of nirvana in this present life. The Buddha's personal teaching suffered gradual change when, after his decease, it encountered other religious systems and propensities. The foundation of Mahayana is traditionally attributed to the philosopher Nagarjuna, about A.D. 200, who compiled a treatise embodying the teaching of the Madhyamaka school, that all is illusion. A rival school, the Yogachara, taught that nothing exists but consciousness.



householders no less than by celibate monks. A third characteristic, the path of devotion, led to the deification of past Buddhas and of exalted future Buddhas. This brought the primitive agnosticism into line with the aboriginal beliefs

both of pre-Aryan India and of adjacent lands, with their reliance upon divine beings and orders of demons of lower rank.

To these compromises is due the eager acceptance of Mahayana for a time in N.W. India, especially by

its immigrant peoples from central Asia. Although Brahmanism regained its hold upon Hindustan, Mahayana tenets led to Lamaism in Tibet, Foism in China, and Japanese Buddhism. Their imposing ritual and vigorous art, associated with spacious temples and images innumerable, made an irresistible appeal to vast populations to whom speculative mysticism offered no attraction. *See* Buddhism; Hinayana. *Consult* Outlines of Mahayana Buddhism, D. T. Suzuki, 1907.

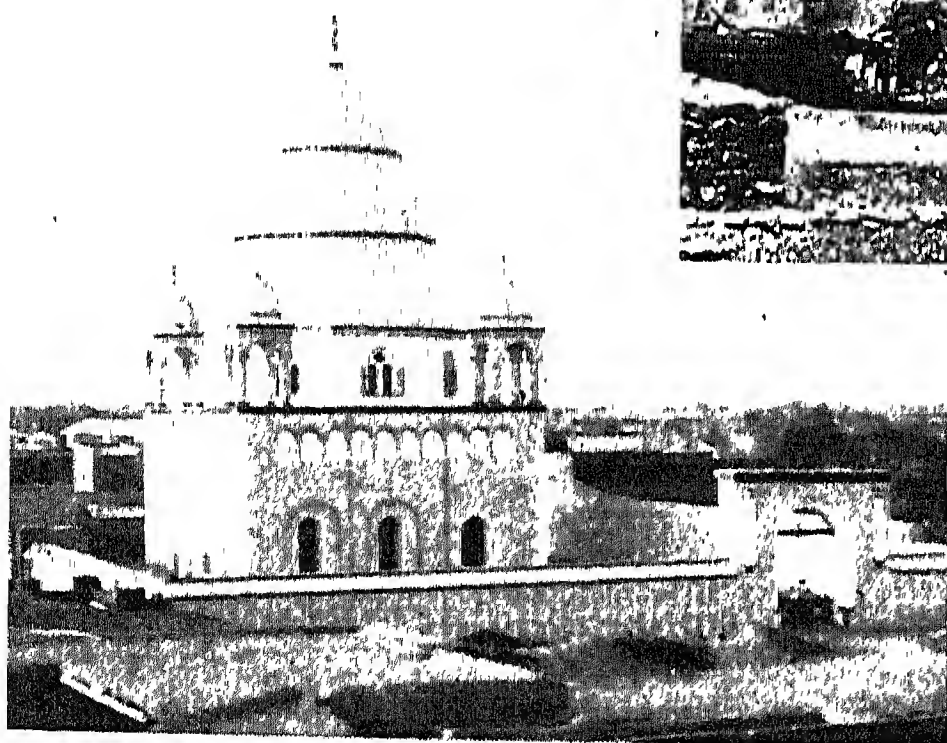
Mahdi (Arab., one who is guided in the right path). Name of the Messiah expected by the Mahomedans. The mahdi must be a descendant of the prophet; he must be proclaimed mahdi against his will at Mecca at a time when there is strife after the death of a caliph;



Mahdi Mahomed Ahmed

and his advent shall coincide with that of Anti-Christ, after whom Jesus will descend in Syria and the reign of righteousness be inaugurated. This is the orthodox view, but in Persia and Asia Minor there have been many pretenders to the title from the time of the first generation after Mahomet. According to the Shiah sect, the mahdi has already appeared in the person of Mahommed Abu-el-Kasim, the 12th imam, who is concealed in some secret place until the end of the world. The most notable of recent mahdis, and the one to whom the name is most generally applied, is Mahomed Ahmed (1848-85). During 1880-84 he proclaimed a mission to free Egypt from foreign yoke, and acquired an ascendancy over the Sudanese tribes. Gordon, sent to withdraw the British garrisons, was besieged in Khartum by Mahomed, and killed. Mahomed died in the same year. His tomb was destroyed by Kitchener's men in 1898. Restored, it was reopened in 1947.

Mahé. Principal island of the Seychelles group, in the Indian Ocean. With an area of 55½ sq. m., it is covered with high granite mountains. The capital is Victoria on the N.E. coast, with a good harbour. There are good roads, and direct telegraphic communication with Mauritius, Zanzibar, Aden, and Colombo. Products are coconuts, cinnamon, patchouli, and essential oils. Colonised by the



Mahdi. The mahdi's tomb at Omdurman as restored and reopened in 1947. Top, right, the tomb after it had been wrecked by the British in 1898

querors of self" of the present age, *i.e.* saints who have raised themselves by their austerities to superhuman rank, and are objects of worship. *See* Jainism.

French, Mahé was captured by the British in 1794.

Mahé. Enclave of Kerala, India, part of Pondicherry state. It is on the Malabar coast, with a harbour of the same name. The French settled here in 1725, and it remained French until transferred to India in 1954. Area 23 sq. m. Pop. (est. 1956) 18,300.

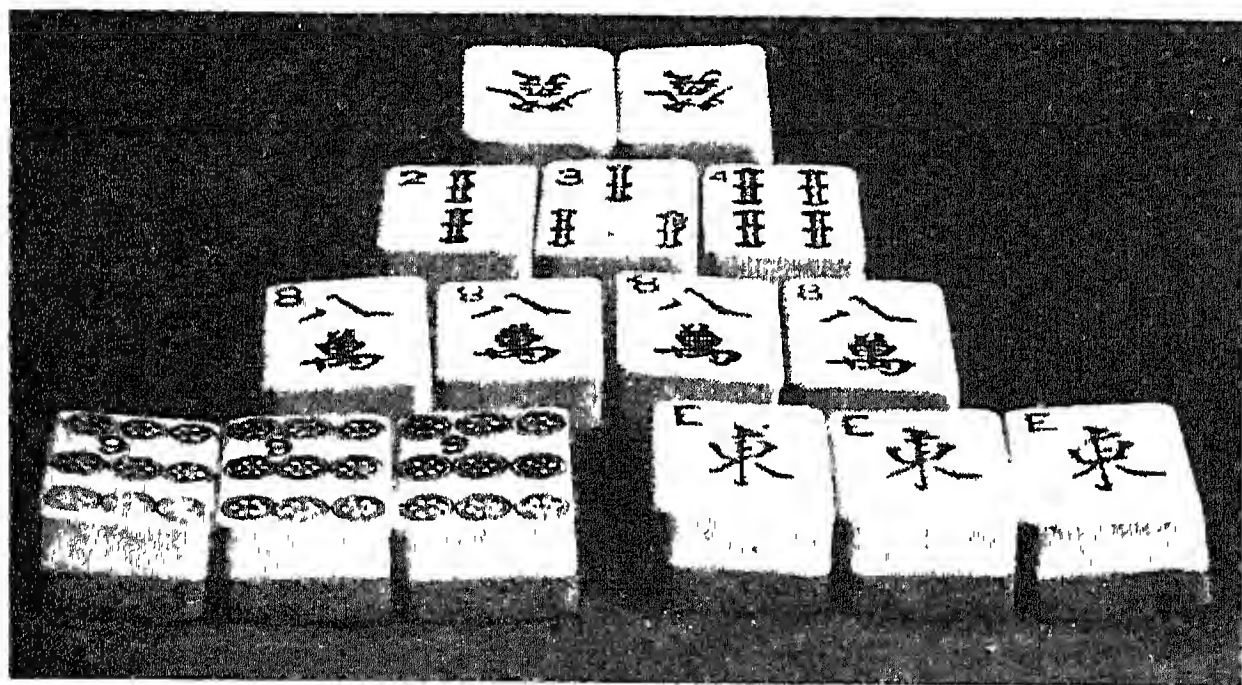
Mahi. River of India. With the Sabarmati, it drains the W. portion of the Malwa plateau into the N. end of the Gulf of Cambay. One headstream rises in the Mahi Hills in S. Rajputana, the other flows N. from the Vindhya range in Central India, and the joint stream flows through Gujarat in Bombay prov. The estuary has a bore at spring tides, and the low bed of the stream makes irrigation difficult.

Mahikantha. Name of a states agency of India under British rule, in the Gujarat div. of Bombay. The area, 3,124 sq. m. in extent, is

traversed by the river Sabarmati. Idar covered more than half the agency, the rest of the area being composed of very small states. All were merged in Bombay in 1948.

dice, and each player is dealt a hand of 13. The object is to collect, by drawing and discarding, a hand consisting of four groups of three tiles each, either all of the same denomination (e.g. three north winds, or three 6 circles), or a suit sequence (e.g., a 2, a 3, and a 4, bamboos); also a single pair. The first player to succeed declares Mah Jongg and exposes his hand. As this will contain 14 tiles, the draw must always precede the discard. Three of a kind may be converted into four, which quadruples its value, and an extra tile drawn immediately so that the required combinations can still be formed; but a sequence can be only three (or six, or nine).

Instead of drawing in his turn from the wall, a player may claim the discard of his previous opponent to complete a sequence by calling "chow"; or the discard of any opponent, whether in turn



Mah Jongg. Typical hand of the winner of a round, made up of three groups of three of a kind (one converted to four), a suit sequence, and a pair

or not, to complete three or four of a kind by calling "pung." As soon as his hand has been brought up to 14 tiles in any of these ways, it is his turn to discard again.

The round ends on a declaration of Mah Jongg or when the last 14 tiles of the wall are reached. The Mah Jongg hand is paid its full value by each opponent; other hands pay or receive their differences; E. always paying or receiving double. Scoring is complicated and somewhat capricious. Though there must be a large element of luck in drawing from the wall, a player may show judgement in calculating chances, and if the discards are played face downwards the game allows feats of concentration.

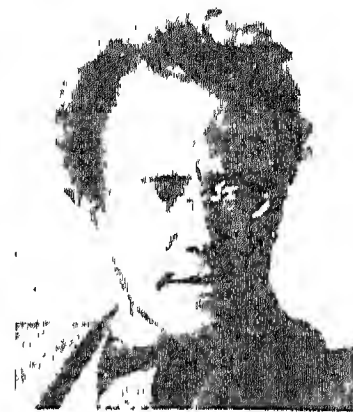
Mahler, GUSTAV (1860-1911). An Austrian composer. Born of Jewish parents at Kalischt, Bohemia, July 7, 1860, he studied at Vienna conservatoire, and in 1878 met Bruckner (q.v.), whose

influence on his composition had a lasting effect. In 1883 he began his career as opera conductor at Cassel, holding appointments at important European opera houses. He was chief conductor at the Metropolitan, New York, 1907-09, giving there the first American performances of *The Bartered Bride*, and *Pique Dame*. He died in Vienna, May 18, 1911.

Of Mahler's nine symphonies the best known are the 8th (choral) and the 9th. They trace descent from Beethoven through Bruckner, but are marked by looseness of structure and unusual harmony. In *The Song of the Earth* (six poems from Bethge's *Chinesische Flöte*) for voices and orchestra, 1908, he achieved perfection of delicacy. His *Kinder-totenlieder* are notable for supreme beauty of phrasing. He was a late romantic who also tried to put philosophical notions into music. There are lives and appreciations by Adler, 1916; R. Mengelberg, 1923; R. Specht, 18th ed. 1925; consult also *Memories and Letters*, A. Mahler, Eng. trans., 1946.

Mahmud I (1696-1754). Sultan of Turkey. He was the son of Mustapha II, and succeeded his uncle Ahmed III, who was deposed in 1730 by a revolt of the janissaries. He continued the war which Ahmed had waged with the Persians, and defeated several armies which Nadir Shah brought against him. He arranged a treaty with Nadir in 1736 for their mutual defence against Russia, which declared war on the alliance, and as a sequel he was forced to cede the Crimea. Successes on the Danube, however, permitted him to conclude an honourable peace at Belgrade in 1739. He died Dec. 13, 1754.

Mahmud II (1785-1839). Sultan of Turkey. Born at Constantinople, July 25, 1785, he was called to the throne on the deposition of his brother Mustapha IV in 1808. He attempted to disband the corps of janissaries and undertook the reorganization of the army on



Gustav Mahler,
Austrian composer



Mahmud II,
Sultan of Turkey

European lines. But the janisseries revolted. In 1809 he declared war against Russia, and in the campaign that followed he lost Bessarabia, Moldavia, and Wallachia. Then the Russian campaign of Napoleon in 1812 permitted him to conclude a favourable treaty with the tsar at Bukarest. He quelled a Serbian revolt in 1814, suppressed the Greek rebellion of 1820-22, and in 1826 caused a wholesale slaughter of the janisseries and abolished that corps. His last years were overshadowed by the second revolt of the Greeks, the naval disaster of Navarino (1827), the Russian invasion of his territory in the same year, and the defection of Egypt under Mehemet Ali. Mahmud's ambitious schemes of reform were thwarted by the Egyptian war, and he was maintained only by Russian support in 1833. He died at Constantinople (Istanbul), July 1, 1839.

Mahmud of Ghazni. Muslim warrior-king of Ghazni in E. Afghanistan, who in 17 campaigns, during A.D. 998-1030, carried Islam into India. Called Butshikan, the iconoclast or "image-breaker," he defeated Hindu rulers, pillaged their cities, and looted their temples, destroying the images of the gods forbidden by Koranic precept. His most famous exploit was the capture of the temple of Siva at Somnath in 1023. Mahmud's wealth and magnificence were legendary; patron also of art and letters, he drew to his court the poet Firdausi and the historian al Biruni. His capital Ghazni had a great mosque, palaces, libraries, and aqueducts.

Mahmud's palace at Lashkari Bazar, in Afghanistan, excavated by a French expedition in 1949, is the only extant building of the Ghaznevid period; standing in parks, it has a great audience hall reminiscent of a Sassanian *divân*.

Mahogany. Term loosely applied by importers and cabinet-makers to the timber of various trees, but belonging properly to *Swietenia mahagoni*, Spanish mahogany, a tall tree, member of the family Meliaceae, native to Central America and the W. Indies. It has a massive, buttressed trunk, glossy leaves divided into paired oval leaflets, and small reddish-yellow flowers in clusters.

The timber was introduced to Great Britain towards the middle of the 18th century, and became very popular for furniture, cabinet-making, etc. In nature the wood is brownish-pink in colour, the



Mahogany. Foliage and flowers of *Swietenia mahagoni*, Spanish variety

red of new furniture being attained by staining. After many years in the manufactured state, it acquires a fine brown tint. It is much used for interior work in ships. In 1873 the tree was successfully introduced to India, Ceylon, and Mauritius. Among the spurious mahoganies are *Ratonia apetala* (bastard mahogany) of tropical America; *Khaya senegalensis* (African or Senegal mahogany) of W. Africa; *Soymida febrifuga* (E. Indian mahogany or redwood) of S. India; and *Cedrela toona* (Indian mahogany and cedarwood), also of S. India.

Mahomedan Art. Term embracing the whole material outcome of the Islamic civilization. In each of the great regions which passed under Mahomedan domination local forms were utilised. But all bear the unifying impress due to the solidarity of Islam, upheld by the supreme obligation of the Mecca pilgrimage.

Mahomedan art, born in A.D. 622, the year of the Hejira, attended the triumphant progress of the Prophet and his companions, and from the outset manifested the tendencies which shaped its distinctive mould. It sprang from the mutual impact of nomadism and sedentary conditions; its splendour and opulence were fostered by the pomp and luxury of caliph and ameer.

The main schools of art resulting from the Islamic impulse are five: Syro-Egyptian, Moorish, Persian, Ottoman, and Indian. Each grew out of the soil, while drawing inspiration from the fountain-head. Each displayed close adherence to tradition and dependence upon

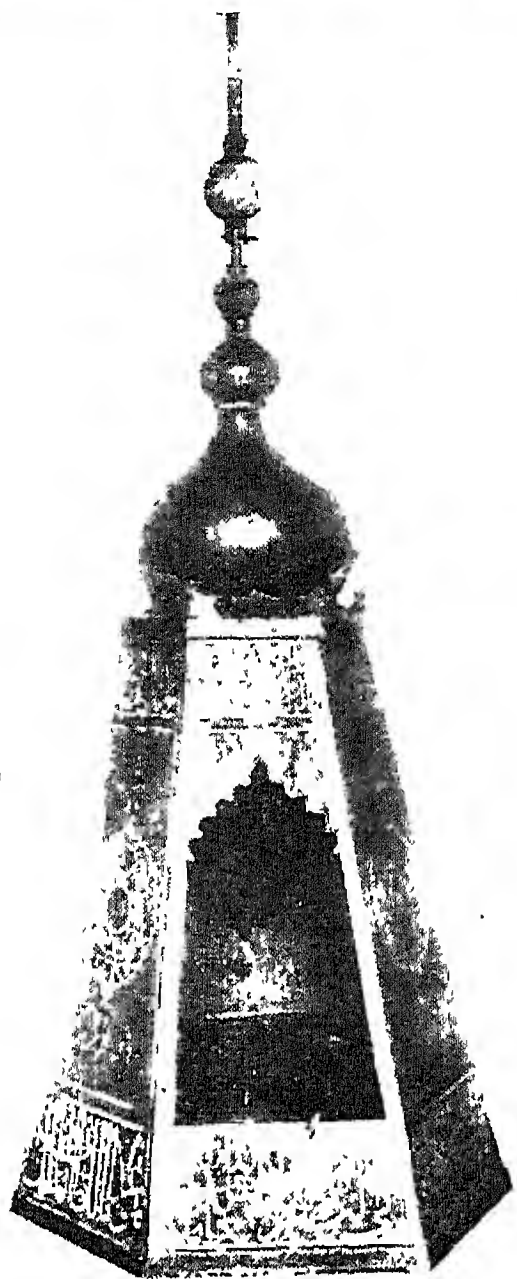
trained craftsmanship rather than creative art. In W. Asia the Mesopotamian inheritance, with its vaulted brick edifices and mural faïence, was interpenetrated by the Byzantine offspring of ancient Greece and Rome. In Egypt age-long traditions inhered in the Coptic crafts. In N. Africa the Romano-Berber tradition, in Spain the Romano-Iberian, still survived. Persia retained its Achaemenian memories, overlaid by Sassanian developments, and modified by central Asian and Chinese contacts. Seljuk and Ottoman influences were brought westward in new outbursts of nomadic energy. In India the Iranian and Turanian ideals of the great Muslim dynasties were engrafted upon the native zest for colour and floral ornament.

The decorative art of Islam, profoundly affected by the Koranic prohibition of images, rests ultimately upon its architectural achievement. The place of prayer set up by the Prophet when he reached Medina was an oblong brick enclosure open to the air, with a stone in the middle of the N. wall to mark the kibleh, or direction of worship, towards Jerusalem. In the 3rd year of the Hejira this was placed towards Mecca, the stone being transferred to the S. wall, and rows of palm branches along this wall sheltered the faithful at prayer. This primitive masjid did not produce the mosque of later tradition, which emerged from the adaptation by the early caliphs of captured churches, notably at Jerusalem and Damascus. The Arab conquerors engrafted upon current architectural forms their own ritual needs, and by reconstructing or re-using Christian materials developed the mosque. Thus arcaded aisles became liwans, pulpits became minbars, forecourts became fountain-courts.

Development of the Mosque

The history of mosque architecture is traceable from its beginnings in those of Amr and Ibn Tulun at Cairo, and those at Damascus, Kairwan, and Cordova, to the constructions of Kait Bey at Cairo, and the greater mosques of Ispahan, Samarkand, Konieh, Bursa, Istanbul, and Mogul India. The minaret, diverging from the Christian bell-tower by being used for vocal calls to prayer, passed out of the square plan, as at Aleppo and Rabat, to the cylindrical, such as the Kutb Minar at Delhi, and to composite designs.

Among the distinctive elements of Muslim architecture are the arching, which may be pointed, stilted and round, horseshoe, scalloped, or clover-leaved; slender shafting, suggestive of the ancestral tent-posts; open trelliswork, cupolas, and stalactitic pendants. Some of these elements were derived through Byzantine practice from Italian originals. They appear



Such are the incomparable Barkuk minbar at Cairo, the 13th century marble vase from Hamath at South Kensington, and the Jama mihrab at Fatehpur Sikri. Stone filigree work reached its zenith in India, as in the Sidi Sayyid mosque at Ahmadabad and upon the marble tomb-screen in the Taj. When secular buildings ignored the Koranic prohibition, as in the lion-fountain of the Alhambra, the result lacked the spontaneity of untrammelled sculpture. Where stone was lacking stucco lent itself readily to Muslim decoration, which reached remarkable levels

in the Alcazar and the Alhambra. Marble mosaic, borrowed from Byzantine craftsmen, was Muslimised in the same way. The inlay of pietra-dura at Agra and Delhi betrays Italian inspiration.

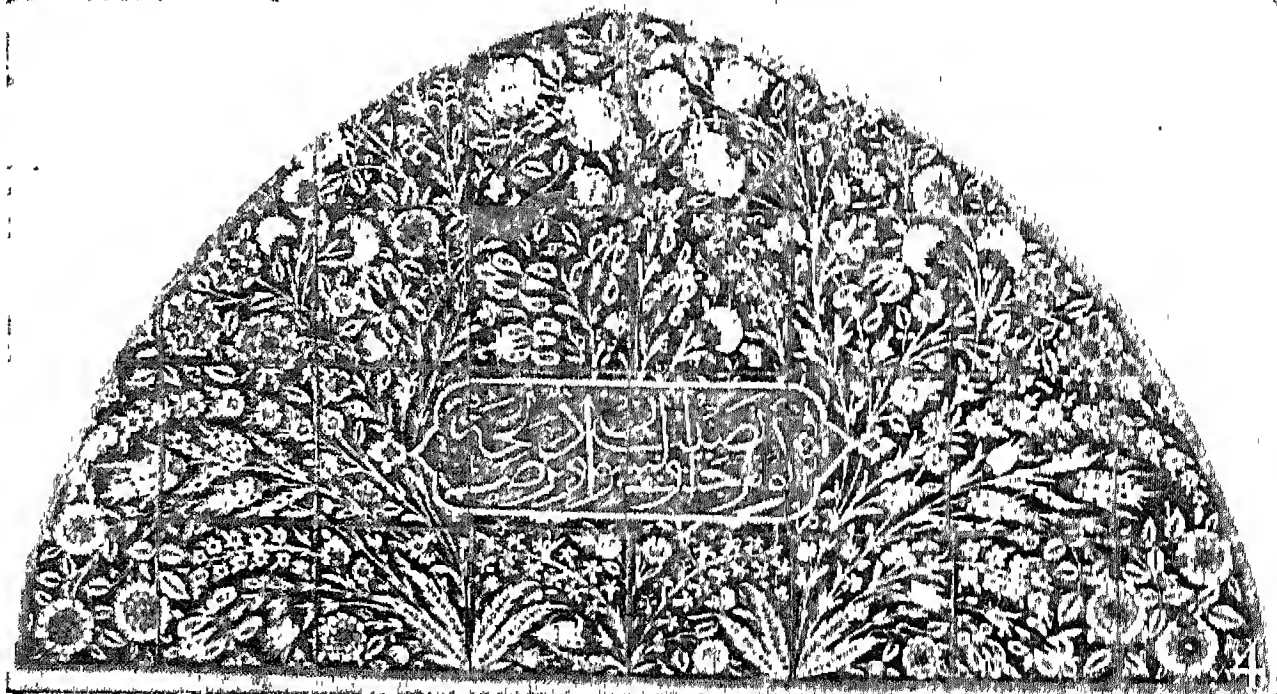
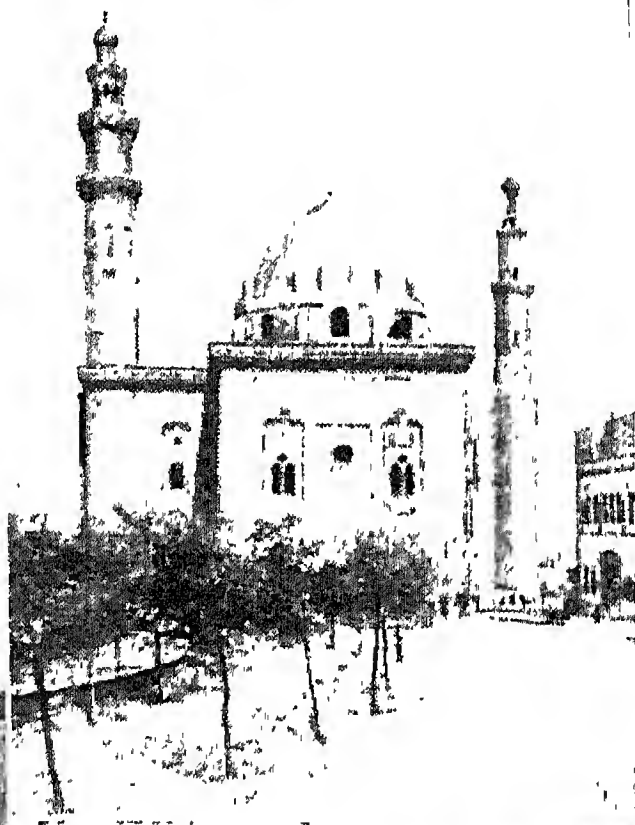
Effects of great distinction were created in wood panelling. Splendid examples are to be seen in Egypt. The Kait Bey minbar in the Victoria and Albert Museum is unsurpassed. Cairo was also the home of the turned lattice-work called meshrebiya. Wood was sometimes with ivory inlay.

The 12th century witnessed an astonishing outburst of decorative art as applied to metal. Mesopotamia still retained memories of ancient hammered work, and when the copper mines near the Tigris headwaters came to be exploited, the output was promptly utilised at Diarbekir and Mosul. Both here and in Persia methods of inlaying metal on metal, at first silver on bronze or iron, were skilfully practised. Damascus was especially addicted to gold inlay. Metal lent itself more readily than cloisonné enamel to arabesque. This metalwork became known in W. Europe through the returning Crusaders, especially in the domain of arms and armour. During the Renaissance, through the craftsmen attracted to Venice, Saracenic metalwork influenced the W. Simultaneous movements eastward led to such Indian developments as Biddery ware.

Nomadic art was at its best in the departments of weaving and leatherwork. The mural surfaces and pavements of permanent structures were replaced in nomadism by tent, curtain, and rug. Plain tapestry weaving, of Neolithic origin, became associated with knotwork in wool and silk. Central Asia produced plain fabrics

in buildings designed for secular as well as religious uses, such as madrasas or schools. Examples are the Alcazar and Giralda of Seville, Shah Jehan's palace at Delhi, the tombs of Timur at Samarkand and Sher Shah at Sahseram, and the Taj Mahal at Agra. Lofty portals, such as that of the Hasan mosque at Cairo, were developed in Persia and imitated in India, as in Akbar's triumphal gateway at Fatehpur Sikri.

The discouragement of images limited the freedom of sculpture in the round. Hence stone decoration relied mostly upon the treatment of flat surfaces with polygonal and arabesque design, or inscriptions of Koranic texts.



Mahomedan art exemplified in architecture and design. 1. Wooden pulpit, panelled and inlaid with ivory, Arabian, 15th century, Cairo. 2. Brass mosque lamp, c. 1468-96, Cairo. 3. Sultan Hasan Mosque, Cairo, built 1356-59. 4. Panel of tiles, from Senariyeh Mosque, Damascus, c. 1580

1 and 2 by courtesy of the Director, Victoria and Albert Museum

with geometrical motives as well as stylised animal and floral form. Knotwork enjoyed greater freedom of design, beautiful pictorial scenes of the chase and the garden being produced. The art became specifically Muslim when utilised for coverings of mosque floors. The individual "prayer-rug," with its mihrab-niche, is well known. Textile hangings on walls and posts were imitated in stucco, mosaic, and faïence.

The genetic relationship of Mahomedan pottery to weaving is best seen in the glazed tiles which—originating in ancient Persia, as in the famous Susa friezes—became another of Islam's contributions to mural decoration. They reached their zenith in the tiled walls of Istanbul, where they simulated silk carpet designs with remarkable fidelity. A variant of this art consisted in the use of cubical pieces of faïence for marquetry, rivalling marble mosaic in freedom and brilliance. Saracenic pottery was also important for ritual and domestic utensils, in part because the lustrous products of its kilns, dispersed from Spain through Majorca to Italy, gave to W. Christendom its medieval and Renaissance ceramic industries. Of equal interest are enamelled glass, notably Syrian mosque lamps, and carved rock-crystal vessels from Egypt. These forms of craftsmanship passed through Venice into the general stream of modern European art.

In the domain of painting, beautiful work was achieved in the illumination of copies of the Koran for the greater mosques, especially in Egypt. Emulous of Byzantine miniature painting, opulent effects were produced by blending gold, purple, and other brilliant hues in floral and interlaced patterns. The innate love of secular poetry and romance in Persia was conjoined with a regard for pictorial design, greatly accentuated by Chinese example. Hence arose a school of drawing and colouring of singular charm. Its influence penetrated to Mogul India, and resulted in those interesting works in landscape and portraiture which earned the encomiums of Reynolds, and rank among the choicest products of Islamic art. *See Alhambra; Arabesque; Arabian Architecture; Damascening; Mosque.*

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MAHOMEDANISM, OR ISLAM

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The beliefs and history of Islam, popularly but inaccurately known in the West as Mahomedanism, are here explained. For other great religions of the world, see Buddhism; Christianity; Hinduism, etc. The Prophet's own life is told under Mahomet

Islam is the religion propounded by the Prophet Mahomet (c. 570–632), although Muslims do not consider that it began with him. In their view it is the natural religion of humanity and was preached by all the prophets sent by God at varying periods to lead mankind to the right path. But later generations, through either wickedness or ignorance, corrupted the message of Islam and so Mahomet was sent as the Seal of the Prophets to fix the faith in its definite form.

When Mahomet began to preach in Mecca (c. 610) that city, an important centre on the trade route between Syria and S. Arabia, was the focal point of a people steeped in idolatry and barbarism and contained an ancient temple in which were kept 365 gods. In the Arabian peninsula itself communities of Christians existed in the Yemen and on the borders of Persia, while settlements of Jews were to be found in various places, the most important group being in Yathrib, later known as Al-Medina. In the neighbouring country of Persia Zoroastrianism was the prevailing faith and Christianity was professed by the inhabitants of Syria, Egypt, and Ethiopia, so that, even before the Prophet's time, certain thinking men in Arabia were alive to their spiritual degradation. The story of the Prophet's own life is told under Mahomet.

Place of the Koran

From the age of 40 until shortly before his death, the revelations which he received, since the Prophet could neither read nor write, were written down or learned by heart by his followers and collected during the caliphate of Othman to form the Koran or, more correctly, Qur'an, which is the religious book of the Muslims containing not only directions for their religious life but also regulations for their secular affairs. It is written in a language which has no peer in Arabic literature, simple yet powerful, and has exercised a far greater influence in the development of the Arabic language than any other writing.

The religion of Islam, which means submission to God and His Divine Will, is summarised in the

two short sentences by which a Muslim (one who submits to God) testifies to his faith, and which every new convert pronounces publicly: "I bear witness that there is no deity but God and that Mahomet is the Messenger of God." The principal idea in Islam is strict monotheism, and it is repeatedly stated in the Koran that the worst of sinners are those who associate, even in the least degree, other deities with God.

Articles of Faith

The Koran (2.177) lays down that a Muslim must believe in God, the last day, the angels, the books revealed by God, and in all the prophets of whom Mahomet is the last. Among these prophets are Moses and the other prophets of the Old Testament, and Jesus. Elsewhere in the Koran it is stated that every nation on earth has had a warner sent to it. The idea that a Muslim believes in predestination is erroneous and a more accurate translation of the word Qadar, which has been translated predestination, would be the law of God by which He rules the universe and which every Muslim must accept as immutable. Muslims believe in the finality of death, to be followed by a life to come in which everyone will be judged and rewarded according to their deeds on earth.

The practices or pillars of Islam enjoined in addition to the above article of faith are prayer, charity, fasting, and the pilgrimage to Mecca. A Muslim is commanded to say five daily prayers of differing lengths in a set form and preferably in the Arabic language, although it is permissible to say prayers in any other language. These are not detailed in the Koran, but the practice of the Prophet as related in the traditions is closely followed. Each prayer must be performed in a state of physical cleanliness achieved by ablutions of the hands, mouth, nose, face, and neck, forearms, head, and feet. The times of prayer are: when it is beginning to get light before the dawn, at noon, when the sun has half-way declined to the setting, just after sunset, and one-and-a-half to two hours after sunset. Each prayer, which is preceded by the call to

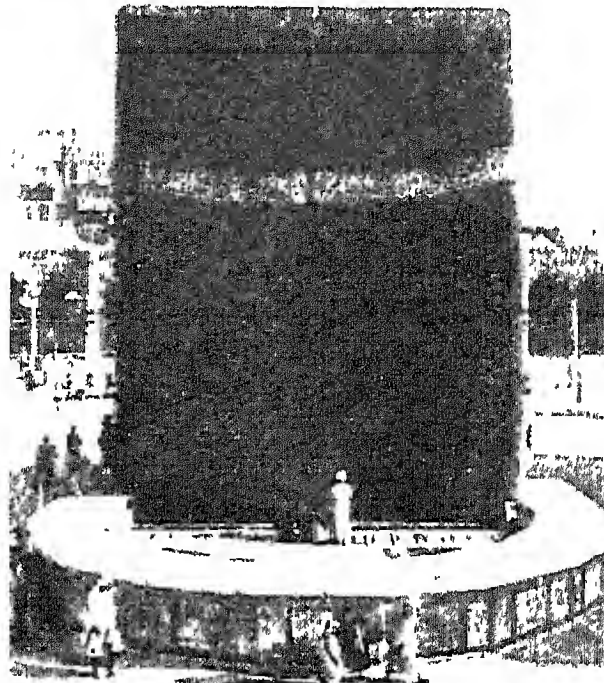
prayer (Azān) given by the Muezzin and consists of two parts, one said in congregation and the other alone, contains a certain number of ritual motions accompanied by a number of recitations of the Fātihah or opening chapter of the Koran and other portions, and ending with the words of greeting to right and left. The day of congregation with the Muslims is Friday, when they assemble in a mosque to hear a sermon given by the imam followed by a short congregational prayer led by the imam. During the year there are two festivals, the lesser on the first day of the month following the month of Ramadān, and the greater on the 10th of the month of the pilgrimage to Mecca, which day marks the culminating day of that great annual event. On each of these two occasions short congregational services are held, followed by a sermon on the importance and meaning of the day celebrated.

Charity is enjoined on the Muslim not only in the broad sense of doing good to his fellow-creatures but it is incumbent on him to spend one-fortieth of his capital every year for charitable purposes.

The Month of Ramadān

Fasting is also of great importance, and to this purpose one whole month of the year, the month of Ramadān, consisting of thirty days, is devoted. During this period no food or drink passes the lips from about two hours before sunrise until sunset. Smoking, too, is discontinued. As the Muslim calendar is a lunar calendar the month of Ramadān falls ten days earlier each year so that the Muslim is not spared the trial of fasting throughout the long and hot summer days. It is a very powerful discipline and a true test of the believer's will-power and stamina when it occurs in summer or in latitudes which enjoy a great deal of daylight.

The last pillar of Islam is the pilgrimage to Mecca, a very ancient custom of the Arabs going back traditionally to the time when the patriarch Abraham built a mosque in Mecca in thankfulness for God's remitting his proposed sacrifice of his son Ishmael. It is to be noted that the Muslims believe it was Ishmael, the ancestor of the Arabs, that Abraham was prepared to sacrifice, and not Isaac. It is the duty of the Muslim to go on pilgrimage to Mecca at least once in his lifetime if he can find the means to



Mahomedanism. The Ka'aba containing the sacred black stone, in the central court of the great mosque at Mecca. Each pilgrim walks three times round it

do so. In the first ten days of the pilgrimage month an immense host of Muslims of all colours and races from the farthest ends of the earth assemble in Mecca all dressed in the same garment, two unsewn white sheets, regardless of their rank or learning or other worldly differences. The ritual of the pilgrimage consists of circumambulating the Ka'aba or central edifice of the great mosque towards which all Muslims face when they say their prayers no matter where they may be, kissing the Black Stone, a traditional relic of Abraham's original mosque which is built into the eastern corner of the Ka'aba, running between Safā and Marwa, the march to Minā, and assembly on Mount 'Arafāt to hear the sermon. On the conclusion of these rituals animals are sacrificed and the flesh given to the poor. The main significance of the pilgrimage is that it brings together Muslims from all parts of the world to get to know one another and the particular problems that face them

in their various countries. After visiting Mecca for the pilgrimage the pilgrims generally travel N. to Al-Medinah where they visit the grave of the Prophet and the scenes of his success. Apart from the regular annual pilgrimage the Muslims can visit the holy places of Islam at any time. This is known as the lesser pilgrimage.

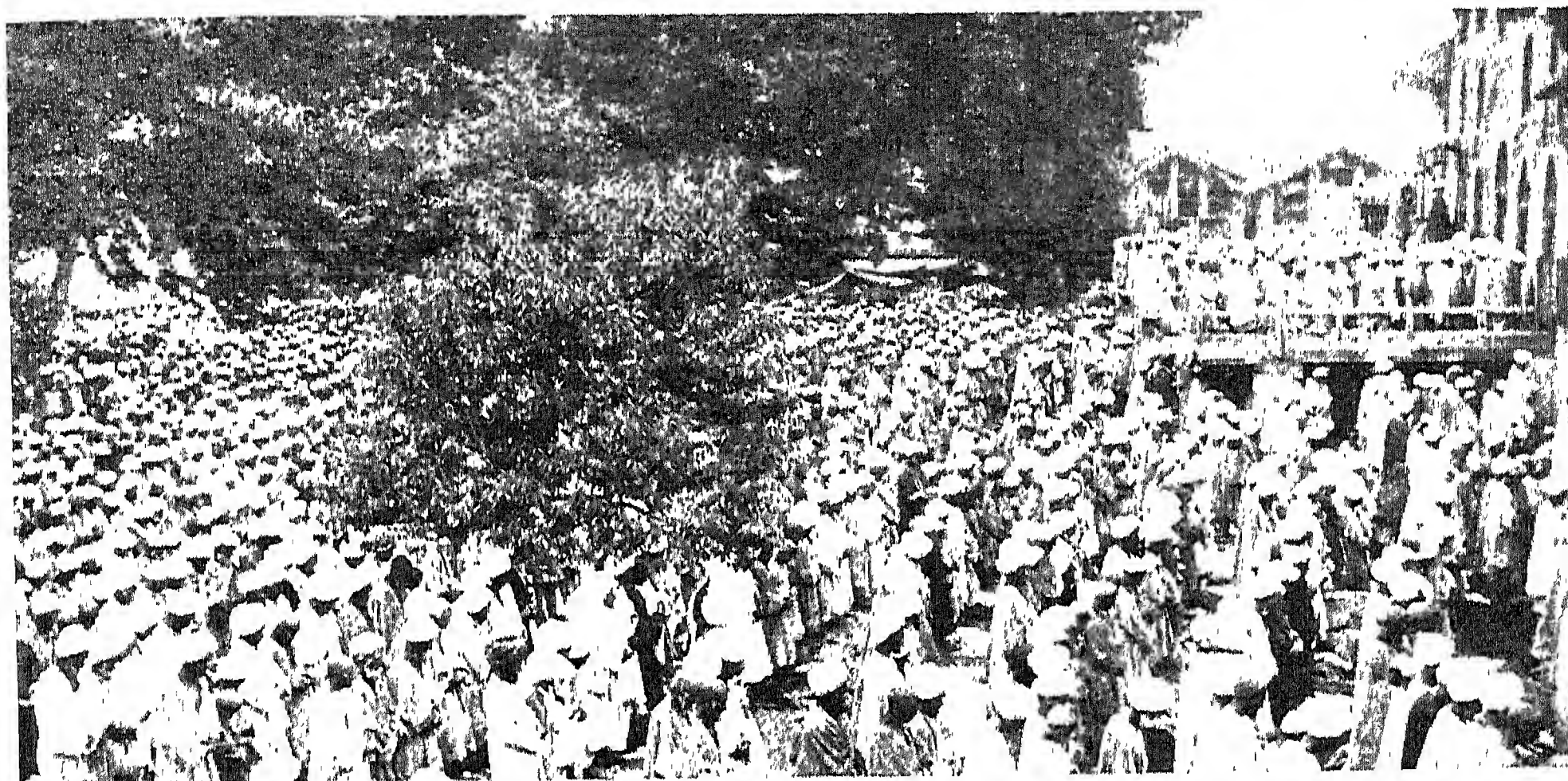
As regards the regulations of his daily life laid down by the Koran, a Muslim is forbidden by his religion to eat the flesh of the pig or any animal which has not been slaughtered in the name of God. Intoxicants are not approved of, and gambling and the exaction of usury are prohibited. Marriage is enjoined on all men who can marry and a Muslim is allowed to have as many as four wives provided he is sure he can treat them all alike. As a matter of fact, monogamy has become the rule rather than the exception in all Muslim countries. The old idea, long prevalent in Europe, that women were considered to be without souls is quite wrong. Divorce is permitted, although the Prophet is reported as having said, "With God the most detestable of all permitted things is divorce."

History Since Mahomet

On the death of the Prophet, isolated attempts were made by a few Arab tribes to regain their previous independence from the central authority and to indulge in a life of brigandage and lawlessness, but the energetic action of the first successor or caliph, Abū Bekr, soon put a stop to these and turned the unbounded energies of the desert Arabs into other channels. It was under the successors to the temporal and to a certain extent the spiritual power of the Prophet that the great expansion took place which carried Islam and



Mahomedanism. Marabouts of the Algerian Sahara in the third posture of the great prayer offered during the month of Ramadān



Mahomedanism. Natives of the Hazara district of the N.W. Frontier Province, Pakistan, at prayer during Ramadan. This is the month of the Mahomedan year when fasting from about two hours before dawn to sunset is compulsory. When Ramadan falls in the hot season, it is a severe disciplinary trial, as drink as well as food is forbidden.

the Arabic language to the Atlantic Ocean in the W. and to China in the E.

Within ten years of the Prophet's death the Arabs had subdued Persia, Syria, and Egypt, and within a hundred years their empire extended from Spain to central Asia. The two principal Arab dynasties which ruled this empire were the comparatively lax Umayyads (660-750), who made their capital in Damascus, and their successors, the 'Abbasides (750-1258), who transferred the seat of the caliphate to Iraq and founded the city of Bagdad. It was under the 'Abbasides that the four schools of theology and law appeared. These are the Hanafite, founded by Imam Abū Hanifa (d. 767), the Mālikite, founded by Imam Mālik, the Shāfi'ite, founded by Imam al-Shāfi'ī (d. 819) and the Hanbalite, strictest and smallest of all, founded by Imam Ibn Hanbal (d. 855). These codes of law are based on differing interpretations of the Koran, but differences only in detail not in substance. Later, in addition to the Koran, the Sunna or Practice of the Prophet was accepted as an authority on points of conduct of the Muslim's life which are expressly indicated in their revealed book. This practice is contained in six canonical books of traditions considered as authoritative by orthodox Muslims. The best known of these collections is the one by Imam Al-Bukhara (d. 869) and the other five were compiled during the following half century.

The great disagreement which divides the Muslim world in two rests on the acceptance or non-acceptance of these six canonical books. Those who accepted the Practice (Sunna) of Mahomet as contained in these collections are known as Sunnis. The party (Shi'a) of 'Ali, cousin and son-in-law of the Prophet, on the other hand, reject the traditions handed down by his companions and substitute another of their own, in which 'Ali is the prominent figure. These are known as the Shi'ites and have their stronghold in Persia, though there are a number of additional communities scattered throughout the Muslim world.

Decline and Reform

After the disastrous Mongol invasions which destroyed the 'Abbaside caliphate in 1258 Islam in its widest sense ceased to be a temporal power, although the process of decay and disruption had begun some centuries before. Under the Ottoman Turks a faint reflection of the splendours of the early 'Abbaside period was achieved, but for some two or three centuries before the first real contact with Europe, occasioned by Napoleon's invasion of Egypt, Islam remained in a deep sleep. The process of awakening took some hundred years and it was not until towards the end of the 19th century that the Muslims became aware of the fact that they were living in a dead world and could not hope to compete with Europe intellectually and materially without reform of their religious and social

outlook. A movement of reform was inaugurated by the Egyptian Shaikh Mohammed 'Abduh (d. 1905) and his school under the influence of a religio-political reformer, Shaikh Jamāl-al-Dīn al-Afghānī.

Islam is and always has been a missionary religion, and continues to make many converts in Africa, Asia, and, to a small extent, in Europe. Actual figures of the number of adherents to this religion throughout the world are not available, but Muslim scholars put forward the figure of from 350 to 400 million, which does not seem to be an exaggeration. During the Second Great War the Muslim states became alive to the important position they held in the Old World, lying as they do across its most important artery, and possessing its principal source of oil. Whether they make worthy use of that realization is a question which can only be answered by history.

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Mahomet or **MOHAMMED** (c.570–632). Prophet of Islam. He was born of the tribe of Koreish in Mecca. His father died before the child's birth, and his mother when he was six. He was cared for by his grandfather, who, though poor, was a leading citizen of Mecca, and, after his death, by his uncle Abu-Talib. At this time there were many Jews in Arabia, especially in Medina and N. of it, and Christianity had also penetrated into the country both from the Greek empire and from Abyssinia. The bulk of the Arabs were, however, idolaters, and worshipped the moon and planets as well as sacred stones. The chief centre of this worship was the Ka'aba (*q.v.*) at Mecca, at which an annual pilgrimage or fair was held. From Mecca also two caravans were dispatched, one to Syria in summer, and one to the Yemen in winter. Mahomet is said to have accompanied his uncle Abu-Talib on one of these trading expeditions to the N. at the age of 12, and again at 25 he repeated the journey as the agent of a rich widow of Mecca, who married him.

Mahomet, thus placed beyond the fear of want, turned to religion. His high reputation at this time among his fellow citizens is shown not only by the trust reposed in him in money matters and in affairs of religion, but in his fidelity to his first wife while she lived. He believed himself to be the recipient of revelations from God through the angel Gabriel. His wife, some of his kith and kin, and a few slaves were immediate converts, but the bulk of his fellow townsmen paid little heed to him. When he began to attack their religion, they replied with persecution. Under this persecution a number of Mahomet's disciples migrated to Abyssinia, but just as his mission appeared about to end in failure, help came from an unexpected quarter.

The Hejira

The city of Medina had long been distracted by a feud between its two Arab tribes, the Aus and the Khazraj. As a last resort they invited Mahomet, whose doctrines they had learned at the annual pilgrimage to Mecca, to come and keep the peace between them. Gradually his followers slipped away to the northern city, until Mahomet, his bosom friend Abu-Bekr, and his cousin Ali alone were left. On July 16, 622, the two former made their escape (*hejira*), and Ali soon followed.

Mahomet was now engaged in warfare against Koreish and the surrounding Arab tribes. He hoped for the conversion of the Jews, but, on their rebellion, he massacred one of the two Jewish tribes of Medina and expelled the other. He gradually extended his territory until, within eight years after he had left Mecca as a fugitive, he entered it as a conqueror. He died master of Arabia.

Prophet and Political Ruler

The public life of Mahomet is split into two halves so distinct that he seems to be in each a different person. In Mecca he was a prophet like one of the prophets of Israel. His sole aim was the conversion of his people from idolatry. The portions of the Koran composed at this time abound in glowing insistence on the unity of God, and in highly coloured descriptions of the Day of Judgment, the bliss of Paradise, and the terrors of hell. In this period Mahomet's proscription of the use of force and his patience under persecution are outwardly Christian, though the Koran shows that his inmost feelings were not so.

In Medina, on the other hand, he became a political ruler. The end in view, the conversion of Arabia, was still the same, but now the end justified any means. According to the statements of some authorities, assassination and murder in cold blood were recognized as legitimate; the conversion of chiefs was bought with presents of cattle; the loyalty of the most powerful converts was secured by numerous marriages; revelations were invented as occasion seemed to require. The fact remains that even his most intimate friends, such as Abu-Bekr, continued to believe in him to the last. The secret of his success lay in his urbanity. He became all things to all men and combated them with their own weapons. He never refused an invitation, and never departed from the severe simplicity of the Arab life. He was *princeps inter pares*, and shared in all the dangers and hardships of his followers. He preferred the reality to the semblance of power. He had one single aim throughout his life, and, though latterly by devious paths, he attained his goal.

The best source for the life of Mahomet would be the Koran, composed by himself during the last 23 years of his life, were not its language and allusions so cryptic as to be unintelligible without the aid of later bio-

graphics. Next comes the contemporary poetry of his adherents, especially his "court-poet," Hassan ibn Thabit, and of his enemies. The defect of this source is that much of it cannot be accepted as genuine. We are thus thrown back upon the four accepted biographies—that of Ibn Ishaq (d. 768), which has been preserved to us in the larger biography of Ibn Hisham (d. 833), and also in the general history of Tabari (d. 922); the book of Mahomet's campaigns by Wakidi (d. 822); and the lives of Mahomet and his companions by Wakidi's secretary Ibn Saad (d. 844). In addition to these there are books of traditions of Mahomet's "table-talk" and habits of life, of which the oldest is that of Malik ibn Anas, who died in Medina in 795, and the best known that of Bokhari, who died in Bagdad in 869. From these sources the general outline of Mahomet's life can be reconstructed with comparative certainty, though tradition varies as to the order of the later events. See *Hejira*; *Mahomedanism*.

T. H. Weir

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Mahón. For details of this town in the Balearic Island of Minorca, refer to Port Mahón.

Mahon, CHARLES JAMES PATRICK (1800–91). Irish adventurer. Better known as The O'Gorman Mahon, he was born at Ennis, Clare, March 17, 1800, and represented it in parliament, 1847–52. He then travelled extensively, and served in the armies of Turkey and Austria. In 1862 he was fighting in Uruguay and espoused the Federal cause in the American civil war. Returning to Ireland in 1871, he supported Parnell (*q.v.*) and was elected member for Clare in 1879. He sat for Carlow from 1887 until his death in London, June 15, 1891. His life was written by Denis Gwynn, 1934.

Mahon, PATRICK HERBERT (ex. 1924). British murderer. On April 10, 1924, Mahon met Ethel Duncan, and decided to rid himself of Emily Kaye, with whom he had been on intimate terms for a year. On April 12 he arranged for Emily to meet him at his bungalow at the

Crumbles, near Eastbourne. She was killed, probably by strangling, and her body locked in a bedroom, where it remained while Ethel Duncan was staying at the bungalow. After taking Ethel Duncan back to London, Mahon returned to the Crumbles, where he dismembered the corpse, burning or boiling the fragments.

Mahon's wife found a cloakroom ticket in his pocket and engaged a private detective to make investigations. At Waterloo station a bag was found containing a woman's bloodstained garment and a long knife. When Mahon arrived on May 2 to claim the bag, he was arrested. The police found bones on the shingle outside the bungalow, the rest of the body being packed in various receptacles. The trial began at Lewes on July 15. Mahon was hanged on Sept. 3.

Mahony, FRANCIS SYLVESTER (1804-66). British humorist. He was born in Cork and educated first for the Jesuit order. A brilliant scholar, under the pseudonym of Father Prout he did much to establish the success of Fraser's Magazine. He also contributed to Bentley's Miscellany, was Rome correspondent of the Daily News, 1846-47, and in later years, when he lived in Paris, was correspondent of The Globe. The Bells of Shandon is a well-known poem by him. He died May 18, 1866.

Mahratta OR MARATHIA. People of Hindu religion in W. and central India. Besides its stricter caste usage, the name also denotes loosely the medley of castes and tribes—such as Kunbis—speaking the 39 dialects of Marathi, which forms the southern group of Indo-Aryan languages. They number about 24 millions of whom a quarter are Mahrattas. Their ancestors entered India long before the 11th-century Mahomedan invasions, and the Brahmans are probably the least diluted representatives of the ancestral stock. In the Kshattriya upper classes and the Sudra peasantry there has been much more mixture with the aboriginals.

The medieval Maharashtra kingdom occupied a triangle from Nagpur to the W. coast towns Daman and Karwar. The Mahratta power first established at Poona by Sivaji in 1657 fell to pieces after his death in 1680, and there followed a period of strife between the military and religious powers. In the early 18th century the five Mahratta states of Gwalior, Baroda, Indore, Nagpur, and the

peshwa's dominion were constituted. In 1778 began the series of wars against the British. Subsequently there were Mahratta units in the British Indian army; in 1921 the title of royal was conferred on the 117th Mahrattas in recognition of distinguished services during the First Great War. In 1922 the designation was changed to 5th Royal Battalion, 5th Mahratta Light Infantry. Mahratta Brahmans, e.g. G. K. Gokhale, played a prominent part in the Indian nationalist movement.

Mahratta Wars. Four campaigns between the British and the Mahratta people of Hindustan. The first war, 1778-82, was fought over the succession of the peshwa, or chief, of the confederacy. There were two candidates, and Great Britain ineffectually intervened in favour of its own nominee, but conquered Gujarat and captured the strong fortress of Gwalior. The treaty of Salbai restored these conquests in 1782. The next campaign, begun in 1803, was undertaken to assist the peshwa, Baji Rao II, who was at variance with a rival, Daulat Rao Sindia and Holkar. The war is mainly notable for the skilful generalship of Wellesley (later duke of Wellington) who, at Assaye, Sept. 23, 1803, defeated Sindia against great odds. General Lake's actions at Farukhabad and Laswari completed the British successes, and the Mahratta chieftains thereupon sued for peace.

The third war broke out in 1817, chiefly because Baji Rao II had grown impatient of the continual presence of the British in his dominions. The revolt was crushed in 1819, and the peshwa made a prisoner by Sir John Malcolm. The Mahratta confederacy was dissolved, and much of the Mahratta territory fell into British possession. The last war was undertaken in 1843 to restore order in Gwalior, the province ruled by Sindia. The battle of Maharajpore, Dec. 29, 1843, fought against great odds by Sir Hugh Clough, virtually concluded the campaign.

Mahsud. Pathan sub-tribe of S. Waziristan, West Pakistan, within the old North-West Frontier province. Occupying the mt. region between the Tochi and Gomal upper valleys, they hold the Gomal pass leading to the level Derajat plains W. of the Indus. They share the democratic temperament and Waziri speech of the South Pathan peoples, but are wilder and more predatory than the N. Waziristan Wazirs. During 1917-21 they were in a state of

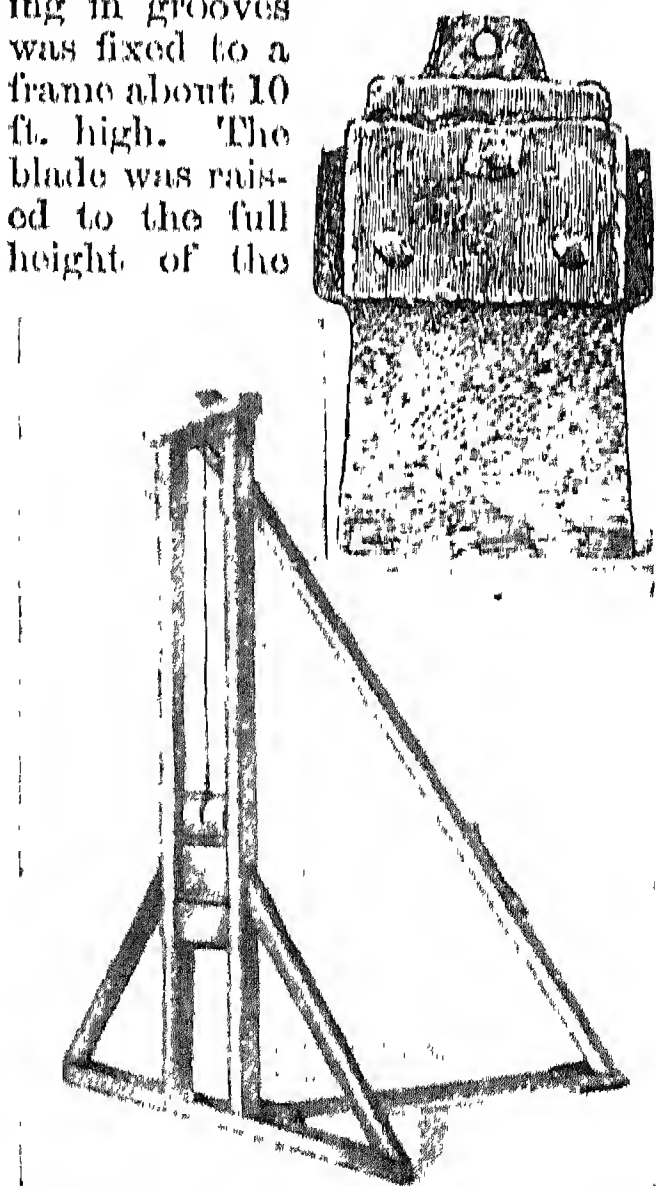
rebellion, and punitive operations were undertaken against them by the British.

Maia. In Greek mythology, eldest of the Pleiades (*q.v.*), the seven daughters of Atlas and Pleione. By Zeus she was the mother of Hermes.

Maida. Town of Italy, in the prov. of Catanzaro. It is 30 m. W.S.W. of Catanzaro on the main road to Pizzo. On the neighbouring plain Sir John Stuart, in command of a British force dispatched to assist the dispossessed Bourbons, defeated French troops under Regnier July 3, 1806. Pop. (1951) 6,122.

Maidanek. Site, near Lublin, Poland, of a German extermination camp during the Second Great War. The camp was overrun by the Russians, July 24, 1944; they found there prisoners of war from the Polish armies of 1939, Russian prisoners, and citizens, some of them Jewish, of Poland, France, Belgium, Italy, the Netherlands, Czecho-Slovakia, Greece, Yugoslavia, Denmark, and Norway. A Russo-Polish commission of inquiry established that 1,380,000 corpses of people killed in the camp by shooting, gas, starvation, and torture had been burned in furnaces and on bonfires.

Maiden. Instrument of execution formerly used in Scotland, and occasionally in the N. of England. In design it was not unlike the guillotine. A weighted blade moving in grooves was fixed to a frame about 10 ft. high. The blade was raised to the full height of the



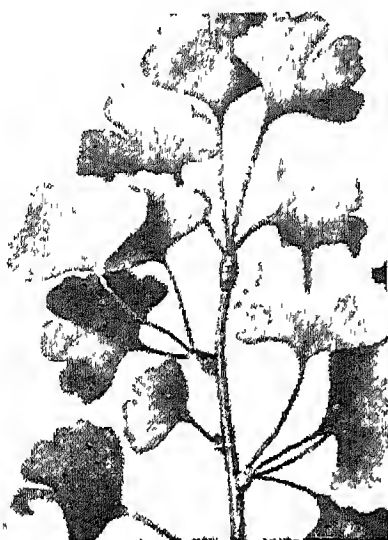
Maiden. Scottish instrument of execution. Top, blade of maiden, preserved in Edinburgh

frame and then released, beheading the victim. It was first used in 1561. Its victims included the earl of Morton, beheaded in 1581, who is alleged to have been its inventor. A specimen is preserved in the museum of the Society of Antiquaries, Edinburgh.

The word maiden is also used for first things of their kind, e.g. maiden speech in parliament and maiden voyage of a ship. A maiden over at cricket is an over in which no runs are scored off the bowler. In some parts of the N. of England a clothes-horse is called a maiden.

Maiden Castle. Name, of uncertain origin, given to a number of prehistoric and later earthworks. The most notable is the prehistoric fortress near Dorchester, Dorset, excavated by (Sir) Mortimer Wheeler 1934-37. It lies on a saddleback hill, 444 ft. above sea-level and over 2,500 ft. long. Its eastern part, occupied by a ditched Neolithic village (10 acres), was reoccupied by Iron Age A people at the end of the 4th century B.C., and somewhat later the whole hilltop (46 acres) was surrounded by a rampart. The inhabitants lived in circular or poly-

treatment in a temperature of 60-70°, and require a soil chiefly of leaf-mould, loam, and sand.

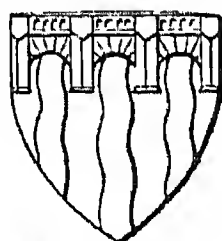


Maidenhair Tree.
Stem and foliage

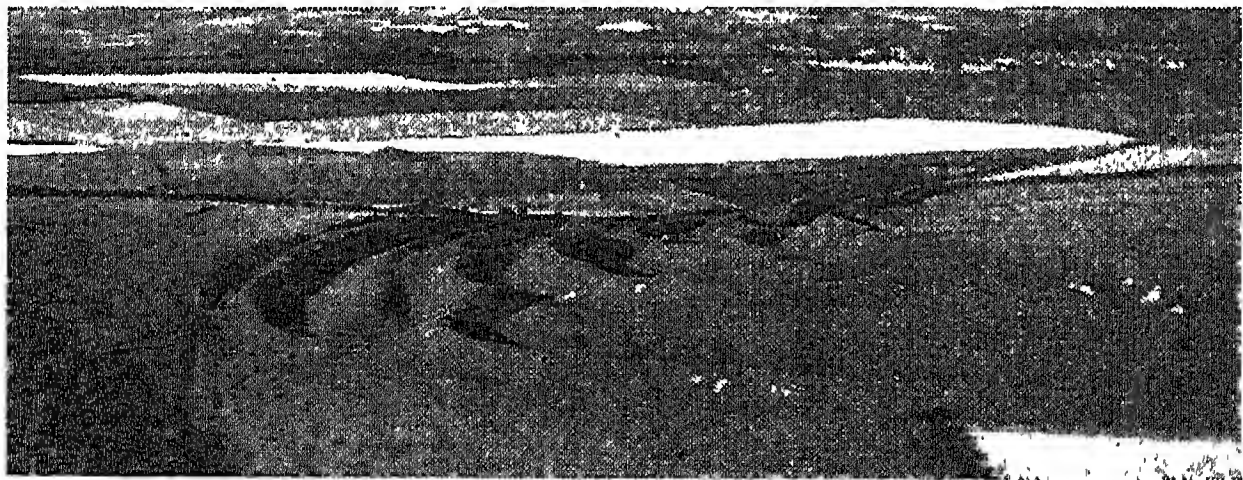
Maidenhair Tree (*Ginkgo biloba*). Tall tree of the family Ginkgoaceae, native to China. It has broad, fan-shaped leaves, cloven at the summit and with notched margins. The male flowers, borne on a separate tree from that which bears female flowers and fruit, form a sort of catkin, consisting of numerous stamens seated on a long spike. The females

consist of ovules only, at the summit of long stalks. When fertilised these develop into plum-like fruits; the seed is in a hard shell enclosed in a fleshy edible wrap.

Maidenhead. A borough of Berkshire, England, on the right bank of the Thames, 24 m. W. of London. Industries include brewing and light engineering. The river here is a great attraction as a boating centre. The bridge across the Thames dates from 1772. The corporation dates from 1582, and the town has had a mayor since 1685. The



Maidenhead
arms



Maiden Castle, Dorchester. Part of the ancient earthworks

gonal huts and stored their corn and other foodstuffs in pits in the chalk. The multiple ramparts and elaborate entrances which are the most striking features of the site were added by successive newcomers in the middle and at the end of the first century B.C. and were stormed by the Romans in A.D. 43.

Maidenhair Fern (*Adiantum*). Herb of the family Polypodiaceae. Natives of tropical and temperate climates, they have delicate, much divided fronds. *A. capillus-veneris*, the common maidenhair fern, is a native of Britain, but now rare, and *A. pedatum* is common in the U.S.A. Given shade and moisture, they thrive under greenhouse

council maintains a library, parks and open spaces, and an open-air swimming pool. At White Waltham is a civil airfield, headquarters of the W. London Aero club and of R.A.F. home command. Pop. (1951) 27,145.

Maid Marian. One of the chief characters in the later poems of the Robin Hood cycle. Her appearance therein is due to the influence of the May games. She is

often referred to as Queen of the May. In some ballads she is a lady of high degree, who assumed the name of Maid Marian when she joined her lover Robin in the greenwood.

Maid of Honour. Unmarried lady in personal attendance on a queen. In the British royal household the maids of honour are in the lord chamberlain's department, and are "in waiting" two or three weeks at a time. Usually daughters or granddaughters of peers, and styled "honourable," they take precedence between daughters of barons and wives of knights of the garter. On marriage they are granted a dowry by the queen, if she approves the match.

A kind of cheese-cake long made at Richmond, Surrey, was called a "maid of honour."

Maid of Norway. For this Queen of Scotland, see Margaret (1283-90).

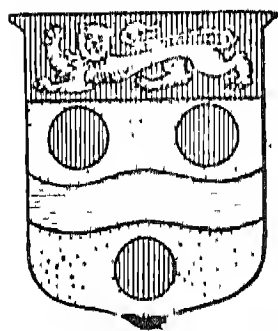
Maid of the Mountains, THE. Musical play, with libretto by Frederick Lonsdale and music by H. Fraser-Simson and J. W. Tate. First produced at Daly's theatre, London, Feb. 10, 1917, with José Collins as the star, it became one of the most popular musical comedies of its day and ran until Dec. 26, 1921, being played 1,352 times. Revivals included those at the London Hippodrome, 1930, and Coliseum, 1942.

Maidstone. Borough and market town of Kent; also the county town. It stands on the Medway, mainly on the right bank, 34 m. S.E. by road from London, and has two rly. stations. The chief church is All Saints, a large Perpendicular edifice, once a collegiate church. S. Peter's church was originally the chapel of a hospital founded by Boniface of Savoy, archbishop of Canterbury. The 16th-century grammar school is housed in a modern building. Its picturesque riverside front visible from Maidstone bridge, the old palace of the



Maidenhead, Berkshire. Riverside road, with the Bath Road bridge across the Thames seen in the distance

archbishops still stands, while another building, a 16th-century manor house, contains the museum,



Maidstone arms

art gallery, and free library. The archbishop's stables, incorrectly called the tithe barn, house an extensive collection of ancient carriages. Other buildings are hospitals, the school of art, gaol, and barracks, and those used for county business. There are the ruins of a 14th century building, once a college for priests.

Maidstone is in the middle of the hop fields. It has also manufactures of agricultural implements, paper, food products, rope, beer, toffee, etc., also malting, quarrying, and engineering works. It is governed by a mayor and corporation.

Maidstone existed in Anglo-Saxon times. Penenden Heath, just outside the town, was from early times the place where the men of the county met, and where criminals were hanged. It is now a public recreation ground. Maidstone became an assize town, and was incorporated, in the 16th century. It was represented in Parliament until 1918, and from 1950 gave its name to a co. constituency. A rising of royalists here, in 1648, was crushed by Fairfax. It is the birthplace of William Hazlitt. Pop. (1951) 54,035.

Maikop. Capital of Adyge autonomous region, R.S.F.S.R. It stands on the Bielaja, 65 m. S.E. of Krasnodar, and is the chief commercial centre of a district that produces a great quantity of petroleum. It is connected with Tuapse on the Black Sea by an oil pipeline. During the Second Great War the Russians, after destroying the oil-wells, evacuated Maikop, Aug. 16, 1942, during the German drive for the Caucasian oil fields. On Jan. 30, 1943, Russian troops recaptured Maikop. Pop. (est.) 70,000.

Maikov, APOLLON NICOLAEVICH (1821-97). Russian poet. Born in Moscow and educated, with the intention of becoming an artist like his father, in Petersburg and Italy, he took to literature. His first volume of poems,

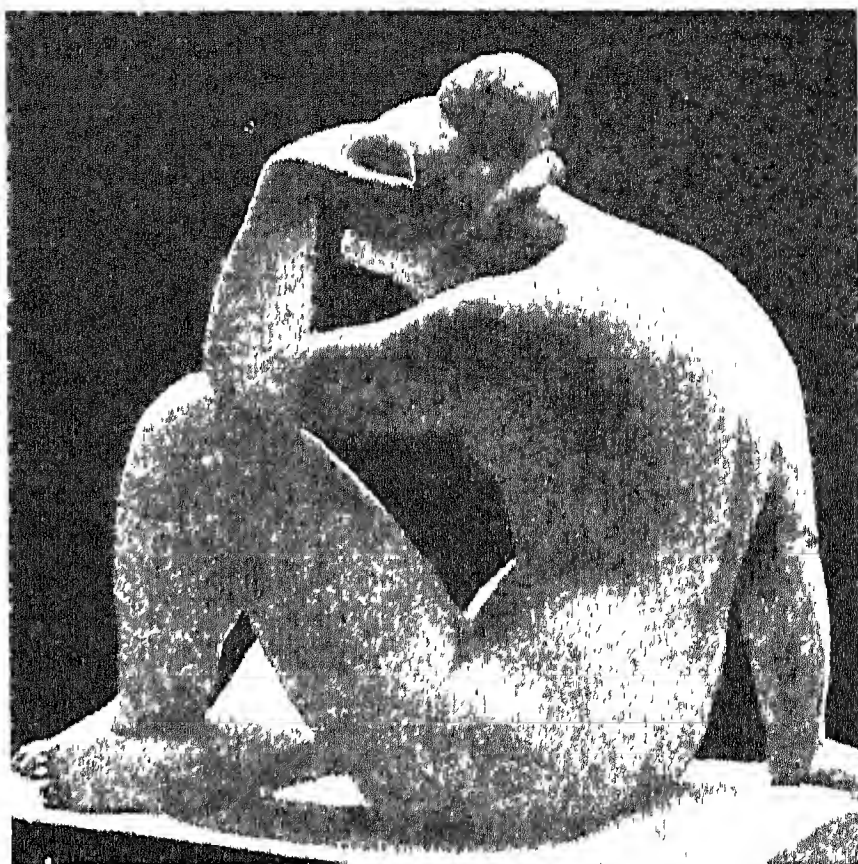
1842, was followed by epics on historical themes, Savonarola, The Queen's Confession, and others; and by two lyrical dramas, Three Deaths and Two Worlds, dealing with the struggle between the Greco-Roman and Christian worlds.

Maillol, ARISTIDE JOSEPH BONAVENTURE (1861-1944). French sculptor. Born Dec. 8, 1861, at Banyuls-sur-mer, Pyrénées-Orientales, he studied at Perpignan and worked in the studio of Cabanel and at the Beaux Arts. He abandoned painting for sculpture in 1900, first carving direct rather than modelling. Large statues in stone and bronze established his reputation; a one-man show in Paris, 1904, attracted attention to his static, three-dimensional work, influenced by early Greek, Chinese, and Egyptian forms. An important work was the monument to Cézanne at Aix-en-Provence, and his finest sculptures include many small terra-cottas. Examples are in the chief European and American galleries. He died as the result of injuries after a motor accident in Sept. 1944.

Maimachin (Mongol. Altan Bulak). Chinese name of a frontier town of the Mongolian People's Republic. It faces Kiakhta, on the Russian side of the border. The name in both languages signifies golden mart. Its once flourishing caravan trade has diminished since the opening of the rly. between Ulan Bator and Kiakhta.

Maimana. Minor province of Afghanistan, formerly a semi-independent state. Area 4,759 sq. m. Its chief town, Maimana, a road junction for Herat and Kabul, was a place of some importance before it was taken in 1874 by the Afghans, who massacred a large number of the inhabitants. It still has a trade in horses and fruits, and makes carpets.

Maimansingh. Alternative spelling of Mymen-Singh (*q.v.*), town of East Pakistan.



Maillol. *La Méditerranée*, sculpture by Aristide Maillol in the courtyard of the Hôtel de Ville, Perpignan
Photo, Vizzanona

Maiming. Term used in English law for the loss of a part of an animate creature's body necessary for fighting. In the case of human beings the word mayhem (*q.v.*) is more usual. The word maiming is more used in connexion with injuries to animals. Under the Malicious Damage Act of 1861 it is a felony to maim, *i.e.* permanently injure, or wound, any cattle, horses, or other domestic animal. Of a number of remarkable epidemics of cattle and horse maiming in the U.K. the most notorious is that known as the Great Wyrley outrages in Staffordshire, which began in 1903 and continued intermittently for many years; they were usually preceded by warning letters sent to the police.

Maimonides, MOSES (1135-1204). Jewish rabbi and philosopher. Born at Cordova, March 30, 1135, he studied Aristotelian philosophy, medicine, and other sciences, among his teachers being Averroës. Driven from Spain by persecution, he settled in Egypt, became physician to Saladin, and lectured on philosophy at Cairo and also at Alexandria, where he founded a Jewish college. He died at Cairo, Dec. 13, 1204. In many works in Arabic and Hebrew he endeavoured to reconcile the claims of faith and reason. His independent thought and the boldness with which he rejected much Rabbinical tradition aroused hostility, though he was afterwards recognized as one of the greatest Jewish teachers. His chief work, first written in Arabic, *The Guide to the Perplexed*, was once used in European universities: Eng. trans. M. Friedländer, 3 vols., 1885.



Maidstone. Church of All Saints and old houses from the Medway
Frith

Main. River of Germany, a tributary of the Rhine. It rises in two headstreams, the Red and White Main, in the Fichtelgebirge on the edge of the Bohemian plateau, and flows W. to join the Rhine at Mainz, after 300 m.

Its tribs. include the Tauber, Saale, and Regnitz; through the last it is connected by Ludwig's Canal (*q.v.*) and the Altmühl with the Danube. A plan to build a new canal link between the Main and the Danube, from Würzburg to Regensburg, was discussed in 1950. Navigation of the Main extends 240 m. above the town of Mainz, the portion between Mainz and Frankfort being canalised and specially equipped for assisting traffic up stream. Besides Mainz and Frankfort, the chief towns in the basin are Nuremberg, Würzburg, and Aschaffenburg. In the Middle Ages the lower valley formed part of an historic route N.E. from Mainz to Kassel and the Weser Valley for the North German plain.

Main. River of Antrim, N. Ireland. It enters Lough Neagh below Randalstown after a S. course of 30 m., and is noted for its salmon.

Maine. Name of one of the provinces into which France was divided before the Revolution. It lay between Normandy, Brittany, and Anjou, and its capital was Le Mans, both names being derived from that of a Gallic tribe, the Cenomanni. It began as a district round Le Mans corresponding to the diocese of that city, and was ruled in the 9th, 10th, and 11th centuries by counts, vassals of the counts of Anjou. About 1100 Maine was united with Anjou, then ruled by the Plantagenet family, and in 1154, when Henry II became king of England, it became an English possession. In 1204 it was retaken by the French king, Philip Augustus, and again it had its own line of counts, junior members of the royal family. Before 1500 it was definitely merged into the kingdom of France, and from about 1600 to 1789 it was a province. It is now covered by the departments of Sarthe and Mayenne.

Maine. Most north-easterly state of the U.S.A., and the largest in New England. It contains West Quoddy Head, the most easterly point in the country. Its area of 33,215 sq. m. is greater than that of Scotland. Maine is bounded N. by Quebec, New Brunswick, and the Bay of Fundy. The coastline is much indented and, including that of numerous islands, measures

2,379 m., with many good harbours. Augusta is the capital and Portland the chief seaport; other places are Lewiston, Auburn, Bangor, and Biddeford. Pop. (1950) 913,774.



Maine arms

Maine is mountainous in the N.W., the highest point being Katahdin, 5,350 ft.; ten other peaks exceed 4,000 ft. and hundreds are over 2,000 ft. One-tenth of the surface is covered with water, including 1,620 lakes; Moosehead being 35 m. long and from 2 to 10 m. wide. There are over 3,000 rivers and streams, those which provide water power including the Kennebec, Penobscot, Androscoggin, Saco, St. John, and St. Croix. Among wooded islands is Mount Desert. Maine is one of the chief summer holiday resorts of the U.S.A.

About 65 p.c. of the land area is forested, mostly coniferous, and lumbering is an important industry, the principal woods being white pine, spruce, birch, hemlock, balsam, oak, maple, cedar, ash, and beech. Maine is the chief producer of pulp and paper in the U.S.A. It is also first in potato output, and other crops are maize, which is canned, oats, buckwheat, and apples. The fisheries are valuable, there is shipbuilding at Bath, and cement, limestone, slate, sand, gravel, and granite are worked. Fish, fruit, and vegetable canning, and the manufacture of textiles and boots and shoes are industries. The state has 1,828 m. of rly., connected with the Canadian system. Two senators and three representatives are returned to congress. The university is at Orono.

It is believed that Sebastian Cabot visited the coast in 1496, and that Norsemen may have done so as early as 1000. English and French tried to found settlements in the territory; the Popham colony, established at the mouth of the Kennebec in 1607, would have antedated Jamestown as the first permanent English settlement in America had it survived. There were built the first church, block-house, and ship in America. In 1622 the council of New England granted to Sir Ferdinando Gorges and John Mason a great tract of land between Kennebec and Merrimac. Gorges established Gorgeana, now York, in 1641 as the first capital of the province and the first chartered city in America.

While England was under Commonwealth rule, Massachusetts took possession of the settlements in Maine, and the territory was formally incorporated in 1691. In 1820, as the result of agitation followed by a popular vote, it was again made a separate state.

The treaty of 1783, which gave the U.S.A. its independence, endeavoured to fix the state boundary with Canada, but the clause was ambiguous. In 1839 the N.E. boundary dispute nearly led to war between Great Britain and the U.S.A.; this was averted by the Webster-Ashburton treaty of 1842, but the agreement was not permanently successful, nor were those of 1846 and 1870. The boundary was finally settled by the Bryce-Knox treaty of 1910. In 1947 a severe drought throughout the state culminated in a series of disastrous fires which destroyed 110,000 acres of standing timber and property worth £6,000,000, and rendered over 6,000 people homeless. The federal authorities declared Maine a distressed area. *Consult Maine, Its History, Resources, and Government, G. Starkie, 1930.*

Maine. Name of a U.S. battleship blown up in Havana harbour, Feb. 15, 1898, with a loss of 250 officers and men. The incident led to war between the U.S.A. and Spain. *See Spanish-American War.*

Maine, Sir Henry James Sumner (1822-88). A British jurist. Born in India Aug. 15, 1822, he



Sir Henry Maine,
British jurist

was educated at Christ's Hospital and Pembroke College, Cambridge, being senior classic in 1844. In 1847 he was chosen regius professor of civil law at Cambridge, and in 1850 he became a barrister. Professor of jurisprudence at Oxford, in 1877 he was chosen master of Trinity Hall, Cambridge, in 1887 professor of international law, and he died at Cannes, Feb. 3, 1888.

In 1861 appeared Maine's *Ancient Law*, which is regarded as the starting point of the study of jurisprudence. He also wrote *Village Communities in East and West*, 1871, *The Early History of Institutions*, 1875, *Early Law and Custom*, 1883, and *Popular Government*, 1885.

Maine de Biran, Marie François Pierre Gontier (1766-1824). French philosopher and

politician. Born at Bergerac, Nov. 29, 1766, he became a member of the bodyguard of Louis XVI, but after the king's death retired to his estate and gave up his time to study. As a royalist he took some part in politics before 1815, and after this was treasurer to the chamber of deputies. He died in July, 1824. As a philosopher, Maine at first held the sensualistic views of Condillac, but afterwards took up the theory of the exertion of power by an ego that wills, as opposed to a non-ego that resists, the object.

Maine-et-Loire. A dept. of France. Part of the old prov. of Anjou, it is roughly bisected by the Loire, other rivers, all in the Loire basin, being the Authion, Maine, Sarthe, Loir, Layon, and Moine. Rly. lines centre on Angers, the capital, the other chief towns being Baugé, Cholet, Saumur, and Segré. The country is generally hilly, except in the N.W., and there are slate, freestone, and granite quarries, and some coal deposits near Chalonnes. The agricultural products include wheat, barley, oats, hemp, and beet; nursery gardening and fruit growing are carried on; and the vineyards are important, the wines of Saumur being well known. Area, 2,811 sq. m. Pop. (1954) 518,241.

Mainotes. Inhabitants of the Maina peninsula, formed by the ridge of Mount Taygetus between Sparta and Cape Matapan, in southern Greece. Although boasting Spartan descent, they probably include a Pelasgian substratum. In their inaccessible fastnesses they preserve a pastoral habit, with olive cultivation, and some survivals of pagan belief.

Mainpuri. Dist. and town of India, in the Agra division of the Uttar Union. The district is situated in the middle of the Ganges-Jumna doab, away from both rivers. Wheat, barley, millet, and sugar-cane are the chief crops; 55 p.c. is cultivated; 70 p.c. of the total area, 1,679 sq. m., is cultivable. Annual rainfall 32 ins.

The town is on the trunk road, and has railway connexion with Cawnpore and Agra; there is considerable trade in cotton, indigo, and wooden articles inlaid with wire. Pop. (1951) dist., 993,890; town, 22,932.

Main Street. Novel by Sinclair Lewis. Published in 1920, it established its author's reputation as a satirist of small town life in America's Middle West, and pillories the parochial narrowness and gossip of a community whose

superficial intellectualism despises its own existence but is unable to achieve anything better. In *Main Street*, Lewis exhibits to the full his gift of satire in dialogue, and his remarkable powers of observation. He does not so much draw characters as dissect them in public on an operating table. *Main Street* became a text book for attacks on provincialism and the complacency of intellectually stagnant middle-class communities. The original of Gopher Prairie, as Lewis called the town he satirised, was Sauk Creek, Minn., his birthplace.

Maintenance. Feudal practice whereby knights and gentry entered into bond with more powerful barons to assume their badge, or livery, and to serve under their banner in war in consideration of support of their private interests and maintenance in their lesser quarrels. As a result, immense power passed into the hands of the barons, and was retained until the end of the 15th century. Statutes were passed against livery and maintenance, but these were virtually disregarded until revived and enforced by Henry VII. See *Cap of Maintenance*; *Feudalism*; *Livery*.

Maintenance. Term used in English law. It is a tort to maintain another in an action at law, i.e. to meddle officiously in a suit by assisting either party with money or otherwise. It is not illegal maintenance to assist a plaintiff or defendant who is a relative or connexion, or a servant, or out of charity. Still less is it illegal to help to pay the expenses of an action in which one has some actual interest, e.g. where a man is sued for trespass, and other citizens subscribe towards his legal expenses so that he can establish a right of way. What is sought to be prevented is officious inter-meddling, particularly where the object is to vex and harass the other party to the suit. Maintenance is also a criminal offence, punishable on indictment.

The most famous action in modern times was *Bradlaugh v. Newdegate*. Charles Bradlaugh (*q.v.*) had incurred penalties by not taking the oath required of members of parliament, whereupon Newdegate maintained a third person to sue Bradlaugh for these penalties. The action failed and Bradlaugh then successfully sued Newdegate for maintenance. Maintenance was a serious menace to the administration of the law in the 15th and 16th centuries when the support of litigants by power-

ful individuals often made it impossible to obtain justice. The court of star chamber under the Tudors did much to suppress it.

Maintenance Order. Order which by English law a wife may obtain from a magistrate's court. Under this order her husband is required to pay not more than £5 a week for her maintenance and not more than 30s. a week for that of each child under 16. Where the child is engaged in a course of education or training, the order may be extended until the child is 21. The court may make a separation order—i.e. a state order that the wife is no longer bound to live with the husband—but this is not now the usual practice, as it will put an end to any desertion of which the husband may have been guilty, and so may prevent the wife from later obtaining a divorce for desertion under the Matrimonial Causes Act, 1937. A wife can obtain a maintenance order only if she can prove some misconduct on the part of the husband. Applications for maintenance orders (made enforceable throughout the U.K., 1950) are domestic proceedings heard in special courts.

Maintenon, FRANÇOISE D'AUBIGNÉ, MARQUISE DE (1635-1719). Second wife of Louis XIV. The



daughter of a Huguenot, she was born in Niort prison, Nov. 27, 1635, but on their release her parents took her to Martinique. She

returned in 1645 to France, where her beauty and wit soon attracted attention, and her marriage with Scarron in 1651 introduced her to intellectual circles. Scarron died in 1660, leaving his widow almost destitute, but she was granted a pension, and in 1669 was engaged by Mme. de Montespan to educate the children she had borne to Louis XIV. Called to court, she soon attracted the royal attention, and in 1678 Louis created her a marquise.

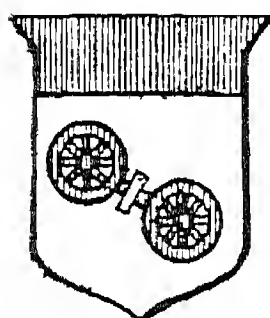
Mme. de Maintenon, as she was now styled, possessed an intelligence which established her high in Louis' favour. Mme. de Montespan was discarded in 1680, and after the queen's death in 1683 the new mistress ruled supreme. In 1684 Louis privately married her, and for the remainder of his life she exercised almost unlimited

Maintenon.
After P. Mignard

power over him, being largely responsible for his zeal for orthodoxy. In 1715, on his death, she retired to St. Cyr, where she had founded a school for girls, and died there April 15, 1719. There are Lives by C. C. Dyson, 1909; H. C. Barnard, 1934.

Mainwaring, SIR HENRY (d. 1653). English sailor. A son of Sir George Mainwaring, he was educated at Brasenose College, Oxford, afterwards studying law in London. In 1611 he obtained a commission to deal with pirates in the Bristol Channel, but soon himself began to follow their practices. He made Mamora, in N. Africa, his base, and in the Resistance was soon feared by the Spanish traders and seamen, on whom he inflicted heavy loss. He refused to accept a high position in the Spanish navy, a bribe offered to induce him to abandon piracy, but when James I took up the matter he decided to yield. He returned to England, and in 1616 was pardoned. *Pron.* Manna-ring.

Mainz (Fr. Mayence). One of Germany's oldest cities, the capital of the *Land* of Rhineland-



Mainz arms

Palatinate. Situated on the W. bank of the Rhine, opposite its confluence with the Main, connected with Kastel, on the E. bank, by a modern bridge blown up in 1945, and with Wiesbaden's suburb Biebrich by another, likewise damaged, Mainz was, until 1919, an important fortress. A main junction on the rly. lines Paris-Saarbrücken-Berlin, Amsterdam-Cologne-Basle, Paris-Nuremberg-Vienna, etc., as well as of the Rhine steamship lines and, with Wiesbaden, of civilian air lines, its river port handled up to two million tons of goods per year; its

suburbs, Gustavsburg, Gonsenheim, Rüsselsheim, etc., were industrialised, with metal and engineering, wagon and motor building, chemical, dye, food preserve, sparkling wine, paper, and printing works; it was also an important gardening and agricultural centre, especially of the wine trade. The university, which existed from 1477 to 1803, was reopened 1946. Mainz also had a teachers' seminary, musical high school, municipal theatre, etc., and many galleries and museums, one being devoted to printing, the invention of Mainz's most famous son, Gutenberg. Pop. (1955 est.) 117,000.

Founded about the time of the birth of Christ by Drusus as a Roman castle, Moguntiacum, on the site of a Celtic and Teutonic settlement, Mainz was the strategic centre of all Roman actions against the German tribes. By the third century a walled town, captured and destroyed several times, had developed round this fortress. It became a bishopric and, in A.D. 747, S. Boniface's archbishopric, a dignity in which many famous men were to follow him: Hrabanus Maurus in the 9th, Hatto in the 10th, Willigis, who helped on the building of the cathedral, in the 11th, Conrad of Wittelsbach in the 12th, Diether of Ysenburg, founder of the (former) university of Mainz, in the 15th, Albrecht of Brandenburg in the 16th century. The archbishops were first primates of Germany, then from about 950 arch-chancellors, and from 1273 electors of the Empire, and power-

ful territorial princes. But for over 300 years the citizens of "Golden Mainz," rich and powerful in turn, struggled, often in sanguinary battles, for their liberties against their ecclesiastical overlords; winning their complete freedom and an elected govt. in 1244, they created, 1254, the league of Rhenish cities, soon affiliated to the Hansa. They lost their privileges again, to archbishop Adolf II of Nassau, in 1462.

After suffering heavily from French and Swedish conquest, during the Thirty Years' War, and again by several severe battles in the wars of the French Revolution, 1792 and 1797, Mainz was ceded to France by the peace of Campo Formio, 1797; the archbishopric was transferred to Ratisbon (Regensburg), 1803; a French bishopric in what became the capital of the dept. of Mont Tonnerre was created in 1802. Returned as a fortress of the German confederation to Germany in 1814, the city was joined to Hesse in 1816, and was garrisoned by Austrian, Prussian, and Hessian troops until 1866. Bishop Baron von Ketteler (1850-77) was an outstanding R.C. leader.

On account of its industries the city was bombed from the air by the Allies on a number of occasions during the Second Great War. The cathedral of S. Martin (975-1490) was reduced to ruins; S. Christopher's (13th), S. Emmeran's, S. Stephen's, S. Quentin's (all 14th cent.), S. Joseph's, S. Peter's, S. Ignatius' (18th), the Holy Ghost hospital (1237), the electoral palace

(1627-1752), the house of the Teutonic order (1720-37) survived, but were badly damaged. The city was occupied by U.S. armour and infantry on March 20, 1945, with little opposition, German resistance W. of the Rhine having collapsed. The city lay within the French zone of occupation after the surrender.

Mais, STUART PETRE BRODIE (b. 1885). British writer and broadcaster. Born July 4, 1885, he went to Denstone and Christ Church, Oxford. From school-mastering he turned to literary criticism and was with various London



Mainz (Mayence). General view (1945) of the city on the Rhine. Top, house in which Gutenberg is said to have set up the first printing press

newspapers, 1918-31. Broadcasting on books and on places in the British Isles, he also made a tour of the U.S.A. for the B.B.C. in 1933-34, broadcasting his impressions. Mais wrote more than 60 books about his favourite authors and districts, several novels, and an autobiography, *All the Days of My Life*, 1937.

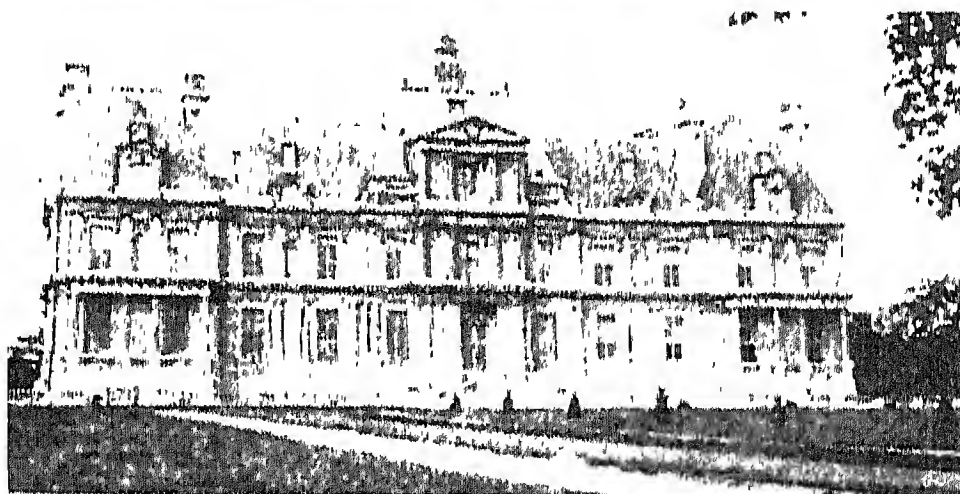
Maisky, IVAN MIKHAILOVITCH (b. 1884). Russian diplomatist. Born at Kirilov, Jan. 19, 1884, he attended an Omsk secondary school and St. Petersburg and Munich universities. Connected with revolutionary movements from the age of 15, he was several times arrested and twice



Ivan Maisky,
Russian Diplomatist

exiled to Siberia; he lived also in Germany and England. After the 1917 revolution he joined the diplomatic service, and was chief of the press department of the commissariat for foreign affairs, 1922. Counsellor at the Soviet embassy in London, 1925-27, and in Tokyo, 1927-29; three years minister to Finland, negotiating a non-aggression treaty with that country; he was in 1932 appointed Soviet ambassador to Great Britain. Maisky carried through a Russo-British trade agreement in 1934 and the naval treaty of 1937. He established diplomatic relations between his own country and Canada and S. Africa, 1942. Awarded the Order of Lenin in 1942, he was assistant commissar for foreign affairs 1943-46.

Maison Carrée (Fr., square house). Roman temple in Nîmes, France, built by Agrippa c. 16 B.C. It is Corinthian, on a high podium, measuring 87 ft. x 45 ft., and is one of the finest surviving monuments of Roman architecture. It has 30 fluted columns, 6 at each end, those at the back and 8 along each side being engaged in the cella walls, leaving 10 to form the porch. Its original timber roof was replaced by vaults in antiquity, and these have survived intact. The temple was used in later times as a church, a warehouse, and even served for a time as a stable. In 1824 it was restored and turned into a museum. It probably stood in the forum of Nemausus and may have been the Capitulum, the official temple of Jupiter. See Nîmes, illus.



Maison-Laffitte, France. View from the grounds of the historic château at Saint-Germain

Maison-Laffitte. Château and museum situated at Saint-Germain, France. It was designed in the 17th century by Mansart for René de Longueil, president of the parlement of Paris, and was known as the Château des Maisons, until it was acquired by the banker statesman, Jacques Laffitte, in 1818. Laffitte sold part of the grounds to enable the farm colony of the same name as the château to be started. The château has associations with the comte d'Artois, the comtesse du Barry, and Voltaire.

Maisonneuve, PAUL DE CHOMEDY, SEUR DE (d. 1676). French administrator. He was born in Champagne, entered the army, and after serving in Holland, in 1641 led a religious expedition to Quebec. On May 14, 1642, he founded the town of Ville-Marie de Montréal (see Montreal), of which he was governor until 1665. Maisonneuve was sent back to France, where he died a disappointed man.

Maistre, JOSEPH MARIE, COMTE DE (1754-1821). French writer. Born at Chambéry, April 1, 1754, of a noble Savoyard family, he studied at Turin, and after holding posts in the civil service became a member of the senate of Savoy. When the French invaded and annexed the district he retired to Lausanne. Recalled to Turin, during 1802-12 he was Sardinian ambassador to St. Petersburg. Probably owing to his connexion with the Jesuits, he left Russia and returned to Turin, dying there Feb. 26, 1821. De Maistre was the founder of ultramontanism, and a representative of the reaction against the materialism of the French illumination and against the Revolution. He upheld the temporal supremacy of the pope. Evil is a punishment, he thought, for original sin; war, the inquisition, and capital punishment are means of expiation.

Maistre, XAVIER DE (1763-1852). French writer. Born at Chambéry, a younger brother of

Joseph de Maistre, he served as a youth in the Piedmontese army. In 1799 he went to St. Petersburg, joined the Russian army, became a major-general, and married a Russian lady. He died at St. Petersburg, June 12, 1852. An

essayist of charm, he was a storyteller classed by Sainte-Beuve with Mérimée for the simple direct vigour of his style. His *Voyage autour de ma Chambre*, 1794, and its continuation, *Expédition Nocturne*, 1825, reminiscent of his temporary imprisonment at Turin, were influenced by Sterne. *Les Prisonniers du Caucase*, 1815, narrates personal experiences.

Maitland. Name of two places of New South Wales, Australia. East Maitland is a town on the right bank of the Hunter river, 120 m. by rly. N. of Sydney, and is a junction on the main line to Queensland for the North Coast rly. Originally a centre of an agricultural district, it has developed as a coal-mining town; there are also brick and pottery works. West Maitland, 2 m. away, is connected with it by tram and rly. Pop. of E. and W. (1954) 21,331.

Maitland, SIR FREDERICK LEWIS (1777-1839). British sailor. Born at Rankellour, Fife, Sept. 7, 1777, he took part in Howe's victory of the First of June, 1794, and was promoted lieutenant of the *Andromeda* in 1795. Two years later he joined St. Vincent's fleet in the Mediterranean, and while in command of the *Kingfisher* helped to capture enemy privateers. He served in the Egyptian expedition, 1801, and on July 15, 1815, when commanding the *Bellerophon*, received the surrender of Napoleon. During 1827-30 he commanded the *Wellington* in the Mediterranean, reaching flag rank in 1830. During 1832-37 he was admiral superintendent of Portsmouth dockyard, and then became commander-in-chief in the E. Indies and China. He died at sea, Nov. 30, 1839.



Sir F. L. Maitland,
British sailor

After S. Woodforde, R.A.
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Maitland, FREDERICK WILLIAM (1850–1906). British historian. Born May 28, 1850, and educated at Eton and Trinity College, Cambridge. Maitland was a well-known scholar in international law, and was called to the bar at Lincoln's Inn in 1876. He devoted his time to the study of law and early institutions, and was soon recognized as perhaps the most original living authority on that subject. In 1884 he was made reader in English law at Cambridge, and four years later Downing professor of laws. His premature death, Dec. 19, 1906, was a severe loss to British scholarship.



F. W. Maitland,
British historian

His greatest work is found in the *History of English Law*, 1895, written by him and Sir Frederick Pollock, and in *Domesday Book and Beyond*, 1897, which did more than any work of recent years to throw light on English society in the 11th and 12th centuries. He edited eight volumes for the Selden Society, which he helped to found, wrote *Justice and Police*, 1885, and *Township and Borough*, 1898, while his *Canon Law in England*, 1898, upset accepted theories. His lectures on the Constitutional History of England appeared after his death, ed. H. A. L. Fisher, who also wrote Maitland's life, 1910.

Maitland, WILLIAM (c. 1528–73). Scottish statesman. He is generally alluded to in history as secretary of Lethington, or as Maitland of Lethington. Having entered the service of the queen regent, Mary of Guise, he conceived a strong suspicion of French intentions regarding Scotland, and became a zealous advocate of an alliance with England. He was appointed secretary to Mary Queen of Scots, and addressed himself to the furtherance of a scheme by which England and Scotland might become united under Mary after the death of Elizabeth. Later he was superseded in Mary's confidence by Rizzio, but after the flight of Bothwell he tried to bring about a marriage between her and



Wm. Maitland,
Scottish statesman

Norfolk. When this fell through he once more retired from court, and on his return was imprisoned in Stirling Castle. Later he became the acknowledged leader of the queen's party. Besieged by the English in Edinburgh Castle, he gave himself up, and died in prison at Leith, June 9, 1573.

Maitreya (Skt. *mitra*, friend). Future Buddha. Sometimes called the Buddhist Messiah, he is regarded as now living in the Tushita heaven, awaiting his earthly advent 5,000 years after Gautama Buddha attained to nirvana. In Tibet he is portrayed as a colossal bodhisattva, or Buddha elect, arrayed in priestly robes, and jewel-crowned. A lamaist temple in Peking contains a wood image of the saint 70 ft. high; at Urga, Mongolia, is a gilt image 33 ft. high. In houses and shops his images represent a merry, obese priest, called by foreigners the laughing Buddha. See Buddhism.

Maiwand, BATTLE OF. Fought between the British and the Afghans, July 27, 1880. Under Ayub Khan an army of Afghans marched on Kandahar, from which fortress General Burrows with a small force issued to meet them, and attacked them at the village of Maiwand, 50 m. from Kandahar. Deserted by some of his allies, outflanked and seriously outnumbered, Burrows, after a hard fight, was obliged to fall back. His native troops broke in disorder, and the retreat became a rout. The honour of the day rested with the Berkshire Regiment, which covered the retreat and had ten officers and 275 men killed. See Afghan Wars.

Maize (*Zea mays*). Cereal, also known as corn, Indian corn, and mealies. One of the two most important cereals in the world, it equals if not surpasses rice in the total quantity of grain produced. A stout annual grass, it is in appearance quite unlike any of the wild or cultivated grasses of the U.K. Male and female inflorescences are separate, the male, called the tassel, being terminal, the female lateral and enclosed by subtending leaves, from between the apices of which the long stigmas, called silks, emerge at flowering time. After fertilisation the female inflorescence produces

the typical ear, which consists of the woody core or cob closely set with paired rows of grain. Maize is naturally cross-fertilised and loses vigour rapidly on self-fertilisation.

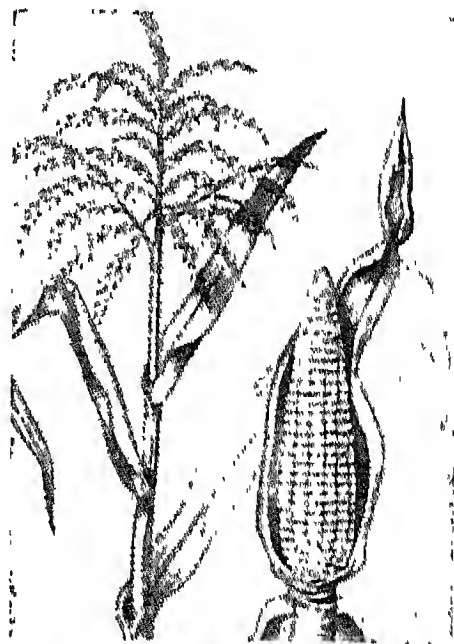
Like the potato and tobacco, it is a New World plant and probably originated primarily in Mexico or Central America. Thousands of varieties differ widely in vegetative and grain characters. Plant height may range from 2 ft. to 20 ft., and time between planting and maturity from 60 days to over 10 months. Having this wide variability, maize has proved particularly suitable as a subject for studies in heredity. It is also the first crop in which hybrid vigour has been exploited agriculturally, giving increases in great yield.

The British climate is unsuitable for cultivation of maize as a grain crop, but it is grown to some extent for fodder, the leaves and stems being cut green and fed to livestock or made into silage. Sweet corn, in which the unripe grain is used as a vegetable, is raised in gardens. The grain, poorer in protein than wheat, is a staple foodstuff in tropical countries, and vast quantities are also fed to livestock. Flour is prepared from the milled grain; the coarser grades are termed hominy, and the finer cornflour.

Majestic. British steamship. Originally the German liner *Bismarck*, she was taken over by the White Star line after the First Great War. Her displacement was 56,000 tons, length 958 ft., and average speed 23 knots. She was sent in 1946 to shipbreakers in the Firth of Forth. Earlier the name belonged to a British battleship of the First Great War, torpedoed by the German submarine U23 off Gallipoli, May 27, 1915.

Majesty. Title of honour. In England it became the official style for the sovereign in the reign of James I, though used earlier, the full form now being His Most Gracious Majesty and The King's Most Excellent Majesty. A king of Spain was styled His Catholic Majesty; of France, Most Christian and Catholic Majesty; of Portugal, Most Faithful Majesty; of Hungary, Apostolic Majesty.

Majolica. Name given to two kinds of ware. One is an Italian enameled ware covered with an



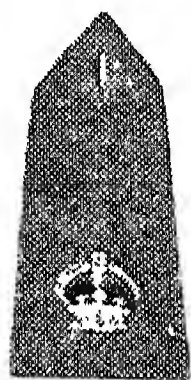
Maize. Left, male flower and leaves; right, cob

opaque tin-enamel glaze which formed the surface for a painted design, and the other is a ware covered with a semi-fluid paste of white or cream colour on which designs were scratched with a point.

True or tin-glazed majolica was first produced successfully by Luca della Robbia about 1440. His enamel was composed of tin, copper, antimony, and other metals, and was fixed by firing in a kiln. His nephew made the process the foundation of a thriving industry. Deruta, near Perugia, was one of the first Italian towns to set up a workshop for majolica, and here, in the 16th century, the art attained its highest degree of excellence in style, design, and colouring. Faenza and Pesaro were other famous centres, and Castel Durante, near Urbino, produced wares finer than those of other factories, in that the clay found in the neighbourhood gave a better earthenware body. Sumptuous majolica was also produced at Urbino, Gubbio, and other towns in N. Italy. Every form of plate, dish, or vase is represented in majolica ware.

Early in the 16th century the lustre colours of Hispano-Moresque were introduced and utilised, especially by Giorgio Andreoli, a great lustre painter of Gubbio. Some of the most famous artists of the Renaissance designed for majolica ware, ornamented as this was with every kind of human and animal forms, Biblical and historical scenes. The form preferred by many connoisseurs is a large simple bowl covered with arabesque scroll work. Majolica is sometimes called Raffaele ware, because the designs of Raphael were used continuously from the 15th to the 18th century. Clever reproductions of old pieces fetch good prices, though not the sums paid for fine authentic pieces. See Della Robbia; Pottery.

Major. In the British Army, officer holding rank next above a captain and below a lieut.-col., and thus the lowest grade of field officer. Majors command squadrons of cavalry, batteries of artillery, companies of infantry, R.E., R.A.S.C., W.R.A.C., etc., and hold grade II staff appointments; the second-in-command of a regt., battalion, etc., is also a major. Promotion to the rank in peace time is normally automatic and by



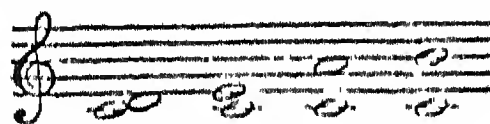
Major. Rank insignia on shoulder strap



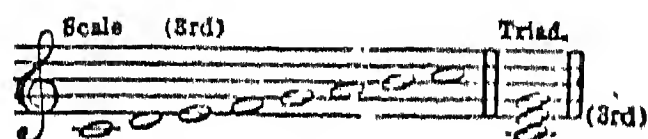
Majolica. Vases and plate of Wedgwood's majolica ware, with paintings by E. Lessore

seniority after a period varying according to the arm. The president of a district court-martial or field general court-martial is normally a major. The equivalent rank in the Royal Navy is a lieutenant of eight years' seniority, and in the R.A.F. a squadron-leader. The insignia of rank is a crown. The rank exists in the American, Italian, and German armies. In the French army the corresponding rank is commandant, a major being the regt.'s medical officer.

Major (Ital. *maggiore*, greater). Term in music referring to intervals of seconds, thirds, sixths, and sevenths, reckoned in the ordinary scale of their lower notes. Thus:



are major intervals because the notes D, E, A, and B occur in the scale of their lower note (C). The fourth and fifth from the keynote are termed perfect instead of major. The major scale and major triad take their names from their thirds:



Theoretically, there is a difference between the whole tones from 1st to 2nd, and from 2nd to 3rd, degrees of the major scale. C to D, above, is a major tone, D to E a minor tone. Similarly there is a theoretical difference between the size of such semitones as F to F sharp and F sharp to G. This difference is called a comma, but in practice it is ignored.

Major OR MAIR, JOHN (1469-1550). Scottish scholar. Born at Gleghornie, in West Lothian, he was educated at Haddington, Cambridge, and Paris. He lectured at the Sorbonne and elsewhere in

Paris, where he lived 1493-1518. Returning to Scotland, he lectured in the university of Glasgow, and in 1522 was transferred to St. Andrews. In 1525 he removed to Paris, but returned home in 1531 to become principal of St. Salvator's College, St. Andrews. George Buchanan and John Knox were among his pupils. Major is chiefly known by his history of

Greater Britain, written in Latin and published in 1521. It has been translated into English, with a biography of the author by A. J. G. Mackay, 1892.

Major Barbara. Comedy by Bernard Shaw, produced Nov. 28, 1905, at the Court Theatre, London. The hero of the play, a satire on indiscriminate philanthropy, is Undershaft, a great armament manufacturer, who, denouncing poverty as the worst of crimes, is responsible for the retirement of his daughter Barbara from the Salvation Army. In the original production the title rôle was played by Annie Russell; most noteworthy of actresses in revivals were Sybil Thorndike and Catherine Lacey, while Wendy Hiller played in the film version, 1941.

Majorca (Sp. *Mallorca*). Island in the Mediterranean Sea, belonging to Spain. Situated 115 m. S.S.E. of Barcelona, it is the largest of the Balearic Isles, being 60 m. in length by about 48 m. wide, with an area of 1,325 sq. m. The coastline is indented with many bays and harbours, and the surface is mountainous, a range of mts. running along the N.W., the culminating point being Puig Mayor, with an alt. of about 5,000 ft. The soil is fertile and the climate usually temperate. The island is generally well watered, and produces wine, oil, cereals, figs, oranges, and other fruits in abundance. There are many mineral and saline springs. Coal, iron, and cinnabar are mined, marble and slate are quarried, the marble of Santany being celebrated, while a number of semi-precious stones, including jasper, serpentine, agate, alabaster, and rock crystal are found.

Of the many stalactite caves, among the finest in Europe, the Cueva del Drach and the Cueva

de Artá are the most remarkable. The most typical industry is the making of glazed pottery, especially majolica. Brandy is distilled, and silk is manufactured to a limited extent. Sheep, mules, pigs, and poultry are reared. There are about 50 m. of rly., linking Palma, the capital, with Manacor, Inca, La Puebla, Alcudia, and Felanitx. Many of the Spanish nobility have palaces in Majorca. At Miramar is the beautiful seat of the Archduke Ludwig of Salvator; at Valdemosa, George Sand wrote her *Spiridion* in 1838. The Albufera Morass, 5,000 acres in extent, in the N.E. of the island, was drained by a London company in 1865-70. The island was peopled by Moors when conquered by Jaime of Aragon, towards the close of the 13th century, and in 1343 it was taken over by Aragon. In the civil war, 1936-39, Franco's forces had a naval base at Palma. Pop. (1950) 341,421.

Major-General. In the British army the lowest grade of general officer; and highest rank (replacing chief controller, 1950) in the W.R.A.C. A maj.-gen. commands a division; the chief of staff, deputy adjutant - general, deputy quarter-master-general, etc., of an army or equivalent h.q. also hold maj.-gen.'s rank. Promotion is by selection. Insignia of rank is a crossed sword and baton, with a star above, worn on the shoulder-strap; red gorget-patches with a line of gold oak-leaves are worn on the collar, and the cap has a red band. The cap-badge is the crossed sword and baton surmounted by a lion and a crown and surrounded by a wreath of laurel. Oak-leaves on the peak of the cap were abolished during the Second Great War. The equivalent rank in the Royal Navy is rear-admiral; and in the Royal Air Force air vice-marshal. The rank exists in the American and German armies; the corresponding rank in the French army is *général de division*.

Major-general was the name given by Oliver Cromwell to the officers in command of the twelve administrative districts into which he divided England for his system of government by military police, established Oct., 1655.

Majorian. Roman emperor of the West, A.D. 457-461, whose full name was Julius Valerius Majorianus. Though owing his elevation to the barbarian Ricimer, Majorian was a sound ruler, being the author of measures for the relief of his subjects from the taxation by which they were sorely oppressed. He also passed laws for the protection of ancient monuments, the use of which for building material had become common. A great fleet which he sent against the Vandals was destroyed by them at Carthago Nova, whereupon he made peace. Majorian, owing to the jealousy of Ricimer, was forced to abdicate, and died five days later.

Majority (Lat. *major*, greater). Term used in several senses. The idea of the majority is at the root of representative institutions in Great Britain and the U.S.A., in which countries, with some exceptions, the receipt of a majority of votes cast means election, whether of one or of thousands. Similarly the votes of the majority, whether large or small, decide questions of legislation: for instance, the Act of Settlement, 1701, was passed by a majority of one. From politics the idea passed into business, differences of opinion about the conduct of public companies being usually decided by a majority, either of directors or of shareholders.

A majority is of three kinds. It may be, as in elections in the U.K., a majority over the next candidate, but not necessarily a majority of the votes cast; it may be a majority of the total votes cast; or, as is required in some cases, of all who are entitled to vote. The president of the U.S.A. requires a majority of the last kind for election. To avoid the results which follow from the first method, by which a candidate who receives only a minority of the total votes may secure election, electoral devices have been adopted, chief among them being proportional representation, introduced e.g. in the Netherlands by an electoral reform act of 1917. Sometimes a bare majority is insufficient—e.g. for acceptance of foreign treaties by the U.S. Congress a two-thirds majority is required. Similarly, in the assembly of the United Nations, a two-thirds majority is necessary, the effect of this being

sometimes to prevent action, even though a majority in favour of a particular course of action may exist. (See Proportional Representation; Representation; Second Ballot; Vote.) For details as to majority verdicts by juries, see under Jury.

To attain one's majority is to cease being a minor and to reach the full status of manhood. It is usually fixed at 21 years of age, but is sometimes 18 or lower. To obtain a majority is to reach the rank of major. To pass over to the majority, used euphemistically of death, is a phrase dating back to the days of Greece and Rome, and the great majority is also frequently used for the dead.

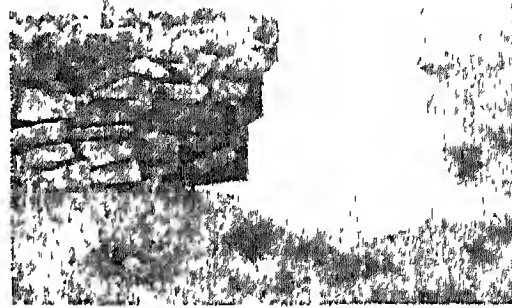
Majuba Hill. Eminence in Natal, at the N.E. end of the Drakensberg range. Its height is 7,000 feet. During the war between the British and the Boers in 1880-81, Sir G. Colley, in command of the former, decided to seize the hill. He took with him 500 men, and on the night of Feb. 27, 1881, the summit was reached and occupied. In the early morning, however, the tired

men were attacked by the Boers, who, after some hours of desultory firing, got to the summit and drove down the British. Colley was killed and about half his force lost. See South Africa.

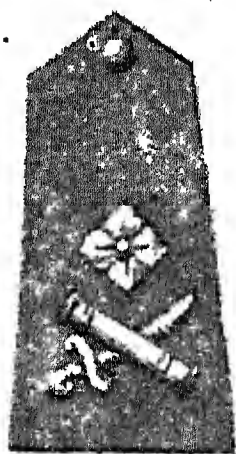
Majunga OR MOJANGA. Province and town of Madagascar. The town is 230 m. N.W. of Antananarivo, on the N.W. coast at the mouth of the Ikopa river. It has some trade, especially in rubber from the neighbouring district, and there are meat preserving factories. Pop. (1955) 46,825.

Makalla, MOKALLA, OR MUKALLA. Chief harbour of the Hadhramaut, S. Arabia. It lies about 300 m. E. of Aden.

Makaroff, STEPHAN (OSSIPOVICH) (1848-1904). Russian sailor. Born at Kiev, he entered the navy as a boy and saw service in the war with Turkey, 1877-78. With intervals he was employed in hydrographic surveys during 1881-96, and in 1901 he made an Arctic ex-



Majuba Hill. Monuments to the fallen erected on the battlefield



Major-General. Insignia on shoulder strap



Stephan Makaroff, Russian sailor

pedition. Governor of Kronstadt, 1899-1904, on the declaration of war with Japan in the latter year he was given command of the Far Eastern fleet. He went down with his flagship, the *Petropavlovsk*, sunk by a mine off Port Arthur, April 13, 1904.

Makart, HANS (1840-84). Austrian painter. Born at Salzburg, May 28, 1840, he studied painting at Vienna and Munich. In 1869 the emperor Francis Joseph invited him to Vienna and in 1879 he designed a large allegory called *Progress*, in honour of the emperor. That year he became professor of historical painting at Vienna academy. He also decorated the Vienna museum of art. He died in Vienna Oct. 3, 1884.

Make-up. Term for the application of powder, rouge, etc., to the face, neck, and hands by women. Between the First and Second Great Wars, social habits altered completely in the matter of make-up. Off the stage, this was previously not used overtly by respectable women except for a slight dusting of face-powder or a colourless nail-polish; moreover, such make-up was always "naturalistic"—intended to be taken for natural beauty. After about 1920 make-up came to be used by the majority of women, young and old, in nearly all classes. The cosmetic trade expanded enormously, while chemical research added new ingredients to the preparations available.

This revival of the ancient art of painting the face was accompanied by an almost equally ancient disregard for the actual appearance of the face under treatment. Instead of touching-up the face she had, a woman tried to paint on to her own the face she wished she had. If she admired the sophisticated, the Cleopatra, or the Juliet, the *femme fatale* or the sweet-Dolly-Daydream type, she strove to impose this upon her own features, which were sometimes intractably of a different nature.

This cult of beauty raised the general level of appearance, turned a good trade into a money-making industry, and proved health-giving in so far as it demanded personal hygiene of a sort once practised almost exclusively by the leisured classes, e.g. care and cleanliness of the skin, the hands, and the teeth.

The list of cosmetics which a woman who has the time and money can use is long and lengthens every day. Its cost varies, not so much because of the price of the ingredients, since even

good ingredients are not very expensive (though some perfumes used in cosmetics are), but because firms catering for luxury-loving clients put their products into expensive containers of china, glass and quartz.

The purpose of the practice of make-up is an object of interest to moralist, philosopher, and sociologist. Whatever its basic purpose—probably the attraction of man—it reached in the 1940s a pitch at which it became virtually compulsory, women of all classes, from factory and office workers to those in society, being as reluctant to appear in public without their customary make-up as with unwashed hands or untidy dress.

One woman may use only powder and lipstick (or a variety of lipsticks each chosen to go with a particular costume, for indoor or outdoor wear, or to suit the degree of lighting expected). Another for her eye make-up alone may use several pots, brushes, and bottles; for her skin vanishing cream, foundation lotion, several shades of powder; and a range of colours in nail-varnish. "Vanity" cases, once the size of a cigarette-case, became much larger containers which were miracles of compression much indebted to plastics for their many little pots and phials. These cases might be neat and workmanlike or glittering and jewelled. Where the handbag of an older generation had a pocket for powder-box and lipstick, the luxurious vanity-case of the mid-twentieth century included a small space for money and latchkey.

Theatrical make-up is a specialised form, in which grease paints of various tints and powder are used to correct the effect of stage lighting or to conform to the age and appearance of the character an actor is representing. There are "straight" make-ups and "character" make-ups, and the latter may require the use of wig, crepe hair, nose putty, water dyes, etc. Make-up for the film or television camera is even more specialised, the strong lighting demanding a flattening or deadening of the natural colouring of the face in order to avoid any appearance of discoloration or unpleasant greasiness in the photographic image.

H. Pearl Adam

Makhach Kala. Seaport of the R.S.F.S.R. Capital of Daghestan A.S.S.R., it lies on the W. shore of the Caspian Sea, about 100 m. E. by S. of Grozny, on the Azov-Baku rly. Its petroleum refineries are fed by a pipe-line from Grozny. It

trades with Persia and has chemical factories, lumber mills, and other works. Pop. (est. 1956) 106,000.

Making-up Trade. Process of making up various cloths and materials into clothing; and the making up of large quantities of cloths, etc., into bundles of more convenient size for dispatch to the wholesalers in the textile trades.

The principal branches of the making-up trade concern tailoring, millinery, and dressmaking. Millinery and dressmaking, although together with mantle making they are sometimes carried on by the same employer, are distinct trades. They have similar conditions of labour, and are united by the bond of union in trades of dress, that is the sewing-machine.

The making up of large quantities of cloths, etc., into convenient bundles for distribution to the wholesale trade in the U.K. is mainly confined to the manufacturing districts of Manchester, Leeds, Bradford, and parts of Scotland. The cloth is wound on to small boards, cartons, blocks, or cards, and is delivered in flat or round packages.

Mako. A town of Hungary, in Csanad co. It is situated near the Maros river, close to the Rumanian frontier, and is 17 m. by rly. S.E. of Hodmezö-Vásárhely, and 19 m. E. of Szeged, with which it is joined by road and rly. Pop. est. 35,000.

Makololo. Section of the Basuto branch of the S. Bantu peoples in S. Africa. About 1823, under Sebituana, they trekked from the Vaal headwaters across the Kalahari and Bechuanaland, reaching the Zambezi about 1835. Driven N. by the Matabele, they subdued the Barotse, and imposed upon them their Sesuto speech. The Barotse virtually extinguished them in 1865. A party who accompanied Livingstone coastwards returned to the right Shiré bank, where two Makololo chiefs founded short-lived states. Themselves extinct, their speech is still the *lingua franca* of the upper Zambezi basin.

Makran or **MERRAN.** Southernmost of a union of Baluchistan (q.v.) states, Pakistan, formed in 1952. Makran lies on the Arabian Sea, and has an important fishing industry. The rivers, usually dry, are occasionally flooded, and the subsequent pools yield irrigation water. Mosquitoes abound. The chief crops are dates, the principal groves being at Panjgur and Kech. Most of the people are Jats. An area formerly in Makran is now Persian. Area 23,200 sq. m.

Makua. Aboriginal Negro tribes of the northern coastlands of Mozambique. They include the Lomwe, and are allied to the Yao. They are agriculturists, characterised by matrilineal descent and matrilocal marriage, and are organized into numerous petty chiefdoms.

Mal or **MALĒ.** Aboriginal tribe of cultivators in Madras, Mysore, and Bengal. Numbering over 2,000,000, they are short, dark, sturdy hillmen, whose customs have been veneered with Hinduism. Some are employed as village watchmen. In 1770 the British encountered them as predatory freebooters raiding from the foothills to the Ganges, and recruited from them a corps which became the Bhagalpur Rangers.

Malabar. Former district of Madras state, India. It lay W. of the Palghát gap, and in 1956 was made part of Kerala state. It was subsequently divided, the northern part to form with the Kasaragod taluk of S. Kanara the new dist. of Cannanore, the remainder forming the new dist. of Calicut. Only a third of the total area is cultivated. The rainfall averages 116 ins. annually. Rice is the only food grain, among other crops being coconuts. Area, 5,790 sq. m. Pop. (1951) 4,758,342. Consult Malabar and the Portuguese, K. M. Panikkar, 1930.

Malabar Coast. Southern half of the W. coast strip of the Deccan, India. It has an average width of 40 m., and lies between the seashore and the hills which are the scarped face of the Deccan tableland. The Malabar coast is in Kerala, and is the S. continuation of the Konkan coast of Bombay; it is reached from the E. through the Palghát gap. The rivers are short, the soil is alluvial, and the rainfall heavy, so that two or three crops of food grains are obtained. Copra and cultivated rubber are also produced. The coast is fringed by a series of connected lagoons.

Malacca. A territory of the Federation of Malaya, bounded N. by Nigri Sembilan and E. by Johore, and extending for 42 m. along the strait of Malacca N.W. of Singapore. Area 633 sq. m. Pop. (est) 240,000.

Its capital, Malacca (est. pop. 45,000) is situated on the Malacca river, 154 m. N.W. of Singapore, with which it has rly. connexion. It was captured by the Portuguese in 1511, by the Dutch in 1641, and by the British in 1796. Restored to the Dutch in 1816, it became a British possession in 1825,

Bencoolen in Sumatra being exchanged for it. It has a training college for women teachers.

Malacca was formerly an independent country of S.E. Asia. It consisted of a long, narrow strip of land stretching S. from Siam.

Malacca Bean (*Semecarpus anacardium*). Alternative name for the Marking Nut Tree (*q.v.*).

Malacca Strait. Channel between the Malay Peninsula and the island of Sumatra, connecting the Indian Ocean with the China Sea. About 500 m. in length, it varies in width from 30 m. to 195 m. Both shores of the strait are low-lying and swampy.

Malachi. Minor prophet. Generally accepted as the author of the last book of the O.T., he may possibly have been a contemporary of Ezra and Nehemiah; but the name is in form identical with the Hebrew for "my messenger," and it may be a contraction of Malachijah, messenger of Jah. The writer deplors the degeneracy of the priesthood and the general falling-off in religious observance, urges repentance, and declares that the Day of Judgement will come suddenly. He deals with the prosperity of the ungodly, and foretells the coming of another Elijah (John the Baptist) to prepare the way for the Messiah.

Malachite (Gr. *malachē*, mal-low). Bright green copper ore used as an ornamental material. Its colour is due to the presence of a basic carbonate of copper. The main deposits are in the copper mines of the Belgian Congo, the Urals, and in the S.W. of copper areas in the U.S.A. Smaller deposits occur in Cornwall, where copper minerals are present, and in Chile and South Africa. Malachite has been used as a pigment. It is highly poisonous.

Malachite Green. Aniline dye prepared by the action of benzaldehyde upon dimethylaniline in the presence of hydrochloric acid or

other condensing agent, and oxidation of the product, tetra-methyldiamidotriphenyl-methane. First described in 1877, it is used for dyeing and printing wool, cotton, silk, and some synthetic fabrics, being much faster on cellulose than on natural fibres. It is also used for dyeing leather and straw, and for coating paper.

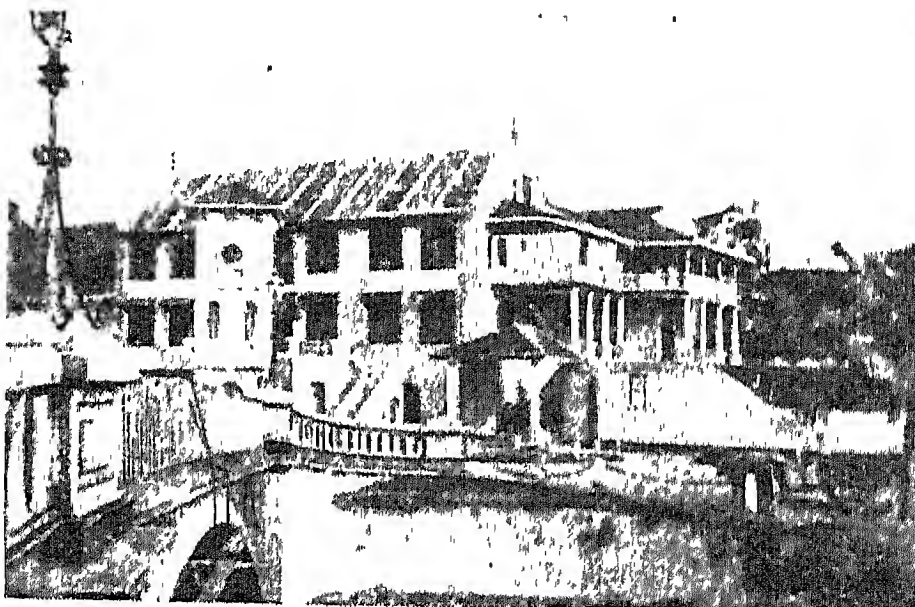
Malachy or **MAELMAEDHOIGUA MORGAI** (c. 1094-1148). Irish saint. Born in Armagh, he entered the monastery founded by Iomhar Ua-h-Aedhagan. Ordained priest in 1120, he became assistant to Bishop Kellaeh or Celsus; abbot of Bangor, co. Down; and bishop of Connor, 1124. He established the monastery of Ibrach; was archbishop of Armagh, 1132-36; and bishop of Down. Venerated for his sanctity and learning, he was appointed papal legate by Innocent II. He died and was buried at Clairvaux while on his way to Rome, Nov. 2, 1148. His life was written by S. Bernard, whom he had first met at Clairvaux when travelling to Rome on an earlier visit to the pope. Malachy was canonised by Clement III in 1190 and is commemorated on Nov. 3.

Another Malachy, of Ireland, a Franciscan, flourished c. 1310, and a third (Malachy Macaodh) was bishop of Elphin, 1307-12, and archbishop of Tuam, 1312-48.

Malacology (Gr. *malakos*, soft; *logos*, science). Branch of zoology which deals with the mollusca. Whereas conchology deals chiefly with the form and design of the molluscan shell, malacology is concerned with the anatomy of the entire animal upon which classification of the molluscs is based. Details of the nature of the radula, reproductive organs, and gills are particularly important.

Malacopterygii (Gr. *malakos*, soft; *pterya*, wing). Name given to a group of fishes which have the dorsal fin supported by soft rays instead of spines. The cod is a typical example.

Malacostraca (Gr. *malakos*, soft; *ostrakon*, shell). Sub-class of Crustacea, including all the more highly organized forms. The name is somewhat misleading to the student who considers its derivation, since this sub-class includes the hard carapace of the



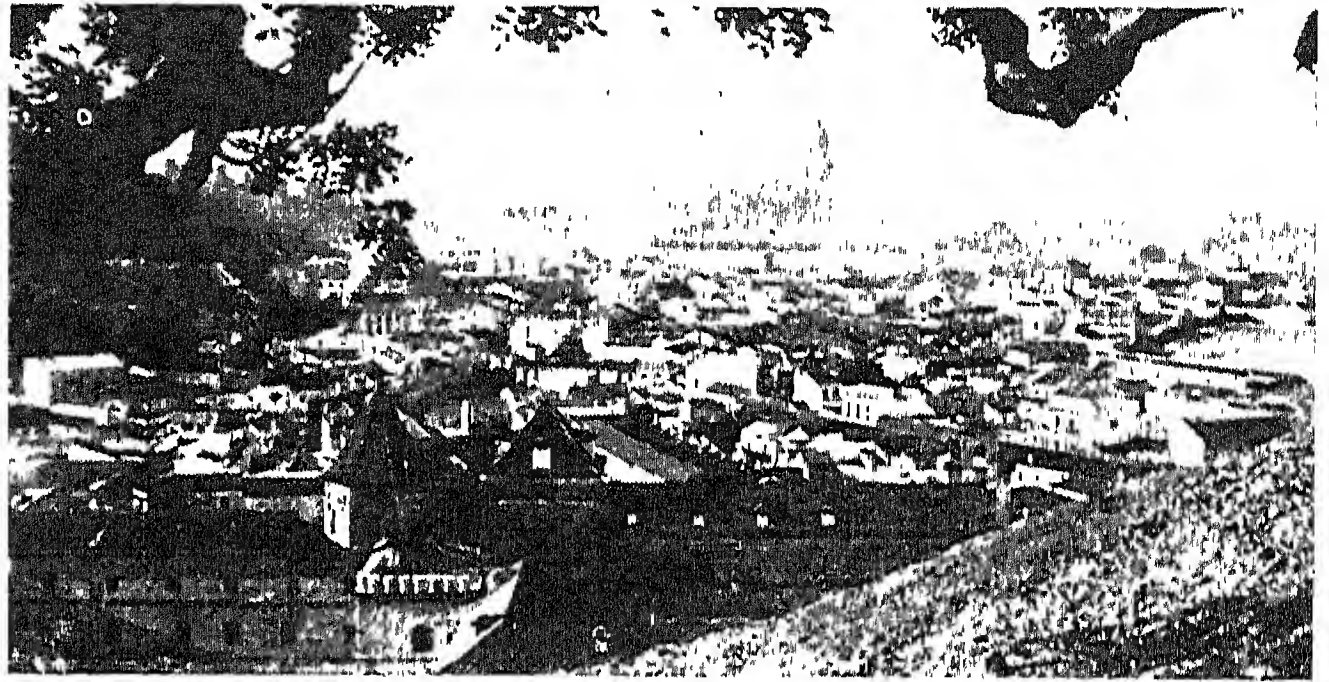
Malacca, Federation of Malaya. The Stadthouse, dating from the time when the town belonged to the Dutch

crabs and lobsters, as well as the thin plates of the shrimps and wood-lice; but it was given originally as a comparative term, to distinguish the exoskeleton of these animals from the shell of the Mollusca. The body consists of twenty segments or somites, of which six compose the head, eight the thorax, and six the abdomen, segments 2 to 20 inclusive bearing a pair of many-jointed appendages, which are variously modified into antennae, jaws, walking legs, and swimming organs, according to their location. The larvae leave the egg in the zoea stage of development. The sub-class includes five divisions—Phyllocarida, Syncarida, Peracarida, Hoplocarida, and Eucarida. See Crustacea.

Malade Imaginaire, LE (The Imaginary Invalid). Molière's last comedy, produced at the Palais-Royal, Paris, Feb. 10, 1673. The central character, Argan, a selfish hypochondriac, originally acted by the author, wishes his elder daughter to marry a doctor, so that he may always have one at hand. Acting, however, on his brother's advice, he pretends to be dead, discovers the designing hypocrisy of his second wife, and the devotion of his daughter, and consents to the daughter's marriage to her lover if the lover will become a doctor. The brother again comes to the rescue by persuading Argan to become a doctor himself, and the comedy ends with the burlesque ceremony of Argan's admission to the degree of M.D. The 17th cent. medical man is severely caricatured. For the ballet scenes the music was written by Charpentier.

Maladetta (Sp., cursed). Central and loftiest section of the Pyrenees. The range trends S. from the main chain, into the prov. of Huesca. Mt. Aneto, or Pic de Néthou, has an alt. of 11,168 ft. See Pyrenees.

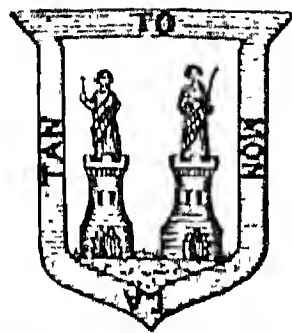
Málaga. Maritime prov. of S. Spain. It is bounded N. by Córdoba and Seville, W. by Cadiz, E. by Granada, and S. by the Mediterranean, its coast-line being broken by the Bay of Málaga. Agriculture is the principal pursuit. The chief products are wine, oil, wheat, grapes, raisins, oranges, lemons, almonds, figs, esparto, sugar-beet, and cane. It contains much mineral wealth, including iron and lead, and there are numerous mineral springs. Scattered throughout the prov. are numerous flour-mills, distilleries, wine-presses, and oil factories.



Málaga, Spain. Panoramic view of the city; the cathedral, begun about 1528, was completed to its present state in the 18th century

Owing to the hilly nature of the province, transit is difficult. The fisheries are important. Area 2,813 sq. m. Pop. (1950) 750,115.

Málaga. Seaport and holiday resort of Spain, capital of the prov. of Málaga. The ancient Malaca,



Málaga town arms

it stands at the mouth of the Guadalmedina river, 65 m. N.E. of Gibraltar, and 120 m. by rly. S. of Córdoba. Protected by hills, it has an excellent climate, making it comparable with the Riviera. Dominated by a ruined Moorish citadel and the 13th-century castle of Gibralfaro, the old town is crowded, its streets being narrow and the houses lofty; but the new suburbs are well built, and stretch into the surrounding country cultivated with vineyards and gardens. The Paseo de la Alameda is a fine thoroughfare.

The harbour of Málaga is deep and commodious, with several moles, and in it ships are protected from all winds. The river alternates from a dry watercourse to a swollen torrent. There are a cathedral (unfinished) with a lofty spire, an episcopal palace, opera house, bull ring, and hospitals, besides a park, pleasant promenades, and an English cemetery. Málaga is noted for its wine, most of which is exported. Other exports include raisins, olive oil, almonds, fruit, sugar, palmetto hats, bird seed, iron, and lead. Manufactures include pottery, mosaics, chocolate, chemicals, spirits, cotton, linen, and lithographed work. Founded probably by the Phoenicians, Málaga became important under the Romans and later under the Moors. It was wrested from the Moors by the Christians in 1487. Pop. (1950) 276,222.

In the Spanish Civil War, Málaga, which had been an important government stronghold, was captured by the Nationalists on Feb. 8, 1937. Its fall ended the winter deadlock between the two sides. The Nationalist assault was made irresistible by Italian and German help in aircraft and men on a new and greater scale.

Malagasy. The name popularly denoting the indigenous population of Madagascar. Numbering over 3,000,000, they represent ancient negroid settlements subsequently dominated by immigrations, extending over 2,000 years, of Indonesian bands coming from S.E. Asia, primarily in outrigger canoes with mat sails. Pre-Mahomedan Himyars from Arabia exerted political and cultural influence upon them, as did settlers from India.

Thus the tall, dark, frizzy-haired, long-headed Sakalava of the W. slope are distinguished from the chestnut-hued, crisp-haired Betsimisaraka of the E. coast, derived from the earlier pastoral Arab immigrations, and from the short, olive, straight-haired, round-headed Hova of the central highlands, whose aspect is almost Javanese.

The prevalent Austronesian speech was introduced before Malay was affected by Sanskrit, and the culture is strongly Oriental, an impression given by such features as oblong pile-houses, vegetable clothing, blowguns, dug-outs outrigger canoes, Asiatic bellows, terrace-cultivation of rice, and taboo customs—locally called *fadi*. Swahili slave-dhows introduced more recently into Madagascar a fresh Negro strain of blood from the east coast of the neighbouring continent of Africa.

Malakand. Pass in West Pakistan. It leads from the valley of the Kabul to that of the

Swat. A branch rly. runs to Dargai, at the foot of the pass, from Nowshera on the Kabul and on the Peshawar-Rawalpindi rly. In 1897 the Swats attacked the British post at Malakand. In the ensuing successful operations of the Malakand field force, Winston Churchill served as war correspondent for the Daily Telegraph, London, and the Pioneer, India.

Malakoff or MALAKOV. A fort of Sevastopol, taken by the French in the Crimean War, Sept. 8, 1855. The batteries were stormed with such fury that in three minutes the French won the fort. Gen. Pélissier, their commander-in-chief, was made duke of Malakoff. The action is commemorated by a vast triptych at Versailles.

Malan, ADOLPH GYSBERT (b.1910). S. African airman. Born at Wellington, S. Africa, he was the son of William Adolph Malan. Educated in S. Africa, after service with the Union Castle S.S. co., he joined the R.A.F., 1936, becoming a fighter pilot. In 1940 he won the D.F.C. at Dunkirk and, while serving in Fighter Command in the Battle of Britain, the D.S.O. Later he was awarded bars to both. He commanded Biggin Hill Fighter station, 1943, and a T.A.F. wing, 1944. A member of the staff of the R.A.F. staff college 1945-46, "Sailor" Malan retired 1946 with the rank of group captain.

Malan, DANIEL FRANÇOIS (b. 1874). S. African politician. Born at Riebeeck W., Cape prov., May 22, 1874, he went to Stellenbosch and the univ. of Utrecht, Holland, became a minister of the Dutch Reformed Church, and entered the Union parl. 1917 as member for Cape prov. Minister of the interior, public health, and education in the Nationalist govt. of 1924, he resigned 1933, and led the Herenigde (Nationalist Republican) party against the Smuts-Hertzog coalition.

Malan moved in the house of assembly, Jan. 12, 1942, that the Union should withdraw from the Second Great War and separate from the British crown. He was exonerated, 1947, by a select committee from charges of dealing with German agents during the war. In the 1948 election his party won 70 seats against the 65 of Smuts's party, and Malan became prime minister. See South Africa.

Malaprop, MRS. Character in Sheridan's comedy, *The Rivals*, who is remarkable for her misapplication of big words. She illustrates her weakness thus: "Sure, if I reprehend anything

in this world, it is the use of my oracular tongue and a nice derangement of epitaphs." This form of humour had been employed by earlier writers (Shakespeare's Dogberry; Fielding's Mrs. Slip-slop; Smollett's Tabitha Bramble), but Mrs. Malaprop stands as the typical misuser of words, and her name, coined from the French *mal à propos*, meaning the reverse of well said, is the origin of malapropism, i.e., a word misapplied.

Malapterurus. Genus of African catfish. They are remarkable for their powers of giving an electric shock. *M. electricus*, found in the Nile, reaches a length of 4 ft. See Electric Fish.

MALARIA: ITS CAUSE AND PREVENTION

Sir Philip Manson-Bahr, C.M.G., D.S.O., M.D., F.R.C.P., Consulting Physician to the Hospital for Tropical Diseases, London

An account by a world-famous authority of the discovery of the cause of malaria, a disease that has sapped the vitality of millions of human beings; of remedies; and of ways to prevent it

Malaria (Ital. *mala aria*, bad air) is a common term for a group of fevers of man caused by parasites which inhabit and multiply in the red blood corpuscles. Formerly it was known by many other names such as ague, marsh fever, remittent fever, etc.

In 1880 Laveran discovered the parasite of malaria, which was named plasmodium, and in 1894 Patrick Manson enunciated his mosquito-malaria hypothesis, which paved the way for the final discovery by Ronald Ross in 1898 that if a certain species of mosquito be fed on the blood of birds infected with a blood parasite, closely resembling that of the malaria organism of man, the plasmodium, after passing through various stages in the stomach wall of the insect, could be transmitted to other birds by the bite of that mosquito. This discovery was confirmed in man shortly afterwards with the human parasite by Ross in Sierra Leone, Grassi in Rome, and subsequently by Bignami and Marchiafava. Almost equally important, Ross discovered that only one genus of mosquito, named *Anopheles* by Grassi, could subserve this particular function. Experiments undertaken in 1900 at Ostia, then one of the most malarious localities in the Roman Campagna, at Manson's instigation, supported the mosquito-malaria hypothesis: for three most malarious autumn months of that year, Drs. Low and Sambon, together with Signor Terzi, and their servants, lived in a specially constructed hut, the doors and windows of which were

Mälar. Lake of Sweden. It communicates with the Baltic Sea through Stockholm, and extends about 80 m. inland, covering an area of 650 sq. m. Irregular in outline, its breadth varies from $\frac{1}{2}$ m. to 23 m., and its maximum depth is 170 ft. It contains over 1,200 islands, and its scenery is magnificent. Its banks are wooded, and studded with country seats, villas, castles, and royal palaces.

Malar Bone. In human beings, the bone which lies behind the upper part of the cheek and the lower part of the orbit. It articulates with the frontal, the temporal, the maxillary, and the sphenoid bones.

protected against mosquitoes by wire gauze. During the daytime they roamed freely about the neighbourhood. They observed no precautions against malaria beyond retiring to their hut from sunset to sunrise. Although their immediate neighbours, the Italian peasants, were stricken with malaria, their use of the mosquito-proof hut at night afforded complete immunity from this fever to its occupants.

Shortly afterwards the reverse of this historic experiment, also devised by Manson, was carried out in London. *Anopheles* mosquitoes, infected with malaria after having fed on suitable patients in Rome, were dispatched in a specially constructed cage to London, and were then made to bite two volunteers, one of whom was Manson's son, Patrick Thurburn; after a period of ten days both volunteers developed malaria and the parasites were demonstrated in their blood. Since that time research work on malaria parasites and mosquitoes all over the world has established that out of over 250 known species of *Anopheles* some 64 are capable, under suitable climatic and environmental conditions, of transmitting malaria.

The geographic distribution of malaria is, therefore, governed by conditions favourable to the development of large numbers of mosquitoes capable of carrying the malaria parasite. (Each species of mosquito has its special habitat, special feeding habits, and special breeding places.) It is also governed by the presence of human beings infected with the malaria

parasite at the right stage of its development: for instance, in villages subject to malaria infected children are more dangerous than adults. The malaria parasite requires a high average temp. (over 60° F.) and high humidity for its development inside the mosquito. Therefore, as a general rule, malaria is most prevalent in the region of the equator, where these conditions most generally prevail, and gradually diminishes N. and S. towards the Arctic and Antarctic.

Distribution and Causes

The distribution of malaria has altered in the course of years. In some places advancing civilization has caused it to die out, as in parts of N. America, in most of N. Europe, and in England. Formerly tertian and quartan fevers were not uncommon in E. and S. England, but, although a certain number of benign tertian malaria cases originated after the First and Second Great Wars in the S.E. (Kentish marshes and I. of Grain), yet England as a whole has become singularly free of it. It occurs to the edge of the Arctic Circle, in Sweden and Finland, and in N. Russia (Archangel, 65° N.) where some British troops became infected in 1919. It is widely distributed in Central and S. Europe, Africa, Asia, New Guinea and Micronesia, Central and S. America. In the W. Indies, too, it is common, with the exception of Barbados (where it was introduced in 1927, but was immediately stamped out). The islands of the W. and S. Pacific are free of it as there are no anopheles mosquitoes there, and so was Mauritius until it was introduced in the middle of the 19th cent. Malaria is still common in southern U.S.A., and in Canada a focus exists on the N. shore of Lake Ontario (42° N.).

Malaria in man is now known to be caused by the entry into the blood of any of the following four species of parasite: *Plasmodium vivax* (benign tertian), *P. malariae* (quartan), *P. falciparum* (malignant or subtertian), and *P. ovale* (ovale tertian). Each of these parasites has a life-cycle and periodicity which are responsible for a distinctive type of fever; for instance, the life-cycle of *P. vivax* and *P. ovale* in the blood occupies 48 hours and produces a tertian fever, or attacks, on alternate days: that of *P. falciparum* occupies about the same time and produces a subtertian type of fever; that of *P. malariae* produces a quartan periodicity with fever every fourth day.

Of these fevers, the subtertian, confined to the hottest and most humid districts, is found in S. Europe (S. Italy, Sicily, Greece), W., Central, and E. Africa, S. India, Malaya, S. China, New Guinea, Central and S. America. It has not the same precise and definite periodicity as the other three, but produces febrile attacks of great severity which vary greatly in length and in virulence. It may produce alarming complications: when the parasites multiply inside the vessels of the brain it causes coma or cerebral malaria. Sometimes the abdominal vessels are affected, when symptoms resembling severe dysentery or cholera are evoked; and in certain circumstances it is the cause of the dreaded and fatal blackwater fever. The underlying pathology of this malignant type is due to the method of development of the parasite, which evokes a stickiness of the red blood corpuscles in which it lives, causing them to agglomerate and clump together, thus impeding or actually blocking the blood flow.

The character of any one of these fevers may be modified or altered by the maturing in the blood at different periods of two broods of a particular parasite, or by infection of the individual with two or even three different species of parasite at the same time. These parasites tend to have a somewhat different geographical distribution. The benign tertian is world-wide; ovale tertian appears to be confined to Africa, mainly to the West Coast; quartan has a local and patchy distribution, being found mainly in Malaya and Ceylon, though it also occurs in the W. Indies, and in S. and Central America.

Characteristics and Duration

An attack of malaria is characterised by a shivering fit, or rigor, soon succeeded by the hot and the sweating stages. Vomiting, often bile-stained, is frequent. In the first stage, the patient shivers with a sensation of cold water being poured down the back, the teeth chatter, and he piles on clothing for warmth; in the second, the shivering ceases and the patient becomes flushed, hot, and dry with intense headache and bone pains; the third or sweating phase is accompanied by the most profuse perspiration and a sense of great relief. The interval which occurs between two attacks varies with each infection.

The duration of malaria is very variable. In the benign tertian

the latent period between two attacks may be as much as a year, and it is reckoned that the parasite may persist in the blood for three years after one inoculation. The quartan is by far the longest-lived and may persist for as long as 21 years. On the other hand, the dreaded subtertian dies out usually within a few months. Ovale tertian produces a very mild, evanescent form of fever.

In the quiescent intervals between the attacks the parasite develops slowly within the blood corpuscles somewhere in the circulation, but where has not been accurately determined. Some think that a different form of development takes place within the lining cells of the capillary vessels. However, when an attack does occur the parasites appear in the blood stream in swarms; Ross estimated that some 150 million are necessary to provoke an ague fit. The actual rigor corresponds to the stage when the parasites have sporulated inside the blood corpuscles to the extent that they disrupt them, thus setting the spores free in the blood serum. As each infected corpuscle is disintegrated and the poisons thereby liberated destroy a great many more, malaria produces serious anaemia. As the malaria parasites live mostly within the blood vessels of the spleen, marked enlargement of this organ is usual.

Combating the Disease

Prevention of malaria depends on the elimination, as far as possible, of the breeding places of that particular species of anopheles mosquito which carries the infection in each particular locality. This involves a close study of the life history and breeding habits of every species of anopheles: some breed in brackish water, others in fresh, some in placid pools, others in running brooks, some seek shade, others light, and so on. It entails draining of swamps, banking of streams, screening of wells, filling in of pools, sometimes the building of sea walls and locks to keep out seawater, etc., and the use of larvicides, especially D.D.T., the most potent insecticide known which destroys both larvae and mosquitoes. The oiling of pools and other collections of water with paraffin or crude petroleum is much practised. The removal of plants and water weeds on which anopheles larvae feed and in which they hide is important. The use of mosquito nets round the sleeping couch at night has become universal in districts subject to malaria;

the spraying of these nets with a solution of 5 p.c. D.D.T. enhances their efficacy. The introduction of larvivorous fish which feed on mosquito larvae has been followed in many places by excellent results. In the W. Indies and S. America "millions" (*Gerardinus poeciloides*) have been employed. Many countries possess fish equally efficacious. The top minnow, *Gambusia affinis*, has been introduced into S. Italy and many other countries with favourable results. In S. India and Java a species (*Puntius javanicus*) feeds on water plants, thus depriving mosquito larvae of their food-supply.

For 300 years and more quinine has been the specific drug against malaria. It acts more quickly and with more certainty than any other drug, and is therefore much the most useful against the subtertian form in the acute stage. There is however, some reason to believe that it may precipitate blackwater fever. Atebrin or mepacrine, introduced by Kikuth in 1930, is a yellow dye which rapidly destroys the parasite, especially the subtertian. It has the disadvantage that it stains the skin yellow, but it has proved a potent drug in preventing malaria, especially under war conditions. During the Second Great War troops in the field took one tablet ($1\frac{1}{2}$ gr.) daily for six days in the week; undoubtedly this precaution greatly reduced the incidence of malaria, and may almost be said to have won the war in India, Burma, and the Far East. Paludrine, a later discovery, is possibly even more remarkable. The dose is one tablet ($1\frac{1}{2}$ gr.) three times daily during a malarial attack. It is very effective in subtertian malaria and has the great advantage of being virtually non-poisonous. As a prophylactic, the dose is one tablet a day during residence in a malarious country. As prophylactics, both atebrin and paludrine should be taken for at least 10 days before exposure to possible infection. Consult Malarial Fever, its Cause, Prevention, and Treatment, R. Ross, 1902; Tropical Diseases, P. Manson, 12th ed., 1945.

Malasia OR MALAYSIA. Name sometimes used to describe the Malay Peninsula and the Malay Archipelago as a whole.

Malaspina. Glacier in Alaska. At the base of Mt. S. Elias, it has a sea front of 70 m., and an area of 1,500 sq. m., and is a glacial plateau fed by numerous large valley glaciers. The front is low, but rises inland to 2,000 ft.; the

surface is generally level, with crevasses near the mountain margin. Glaciers break away from the W. edge; elsewhere large and small streams issue from ice caves and discharge coarse silt which builds the land seawards.

Malatesta. Italian princely family. The parent stock of the Malatesta settled in Rimini in 1216,



S. Malatesta,
Italian soldier

Giovanni being podestà of that city in 1237, and Malatesta di Verocchio assuming the supreme power in 1295. Giovanni, brother of the latter, was husband of Francesca da Rimini, whose love story is told in Dante's Inferno. The family were ardent Guelph partisans and during the Renaissance rose to considerable power. Sigismondo (d. 1468), son-in-law of Francesco Sforza, was a noted patron of the arts and a capable general, fighting as a mercenary in the armies of Venice, Naples, and Florence, and making war on Pope Pius II, who excommunicated him in 1460. Pandolfo IV sold Rimini to the Venetians in 1503.

Malatya. A town of Asiatic Turkey. Situated about 115 m. N.W. of Diarbekir, on a plateau, alt. 3,000 ft., it is an important centre of trade in the upper course of the Euphrates, a great road junction, and served by rly. It lies among beautiful vineyards and orchards. In the neighbourhood are copper workings. In 1895 about 3,000 Armenians were massacred here by the Turks. Pop. 41,559. Some 5 m. N.E. is an older Malatya, the ancient Melitēnē, from which the majority of the people migrated to found the new town. A vilayet named from the town has a pop. of 438,397.

Malaviya, MADAN MOHAN (1862-1946). Indian politician. Born at Allahabad, Dec. 25, 1862, he was educated at the government high school and Muir central college. Associated with the Indian national congress almost from its inception, being a delegate in 1886, he edited The Hindustan, 1887, The Indian Union, 1889-92, and later helped to found the Nationalist daily, The Leader. On the United Provinces legislative council 1902-12, he was elected to the imperial legislative council in 1910,

sat ten years, and was president of congress in 1909, 1918, and 1933. He deprecated the extremism of its later manifestations, although obsessed by the idea of British exploitation of his country. His outstanding work was the creation of a Hindu university at Benares. When non-cooperation was rife in 1930, he resigned from the legislative assembly, and subsequently underwent imprisonment. Nevertheless he came with Gandhi as a delegate to the round table conference in London. This vehement advocate of Indian political advancement died at Benares, Nov. 12, 1946.

Malay. General name applied to peoples of Mongoloid stock in the Malay Peninsula and Archipelago. Their physical characters have been modified by their tropical habitat, and their cultural inheritance has been modified by the acquisition of seamanship. They include the main populations of Java and Sumatra, the Borneo Iban, the Celebes Bugi, the Bajau rovers, some Philippine and Formosan tribes, and distant offshoots in Madagascar. They number 50,000,000 all told.

The true Malays, forming a small fraction of the Malayan branch, call themselves Orang Malayu. They descend from an ancestral tribe in Sumatra, which, after some infusion of Hindu blood and culture from A.D. 400 onwards, crossed to the mainland and founded Singapore about 1160. They spread also to Java, and carried their maritime trade and piracy



Malay. Chieftain in semi-European costume. Inset, head of typical Malay girl

to other coasts, often driving the Indonesian aborigines, as in Borneo, into the uplands. Recent colonies have reached Ceylon and S. Africa and other parts of the British Commonwealth.

A well-knit, olive-brown people, with high cheekbones and small hands, they betray some ethnic admixture, possess a uniform temperament, and are easy-going, reserved, impassive, and intelligent. Under Arab contact the Malays became muslimised during the 13th-15th centuries, but are still animist at heart. Their spirit-worship and sorcery include a belief in man-tigers, and the related semi-hypnotic state called *latah*. Though some Malay groups retain a clan structure, the political organization of the majority is into classes, lower and aristocratic, with hereditary rulers. Coast Malays have become predominantly fisherfolk; inland Malays, living by preference in pile dwellings along rivers, grow rice as a staple crop, sugar-cane, tapioca, coconuts, and other products. Their language is a sub-family of the Austronesian division of the Austric family.

Malayan Federation. Independent country of the British Commonwealth. It occupies that part of the Malay peninsula S. of Siam, and includes Penang and Malacca (formerly the British Straits Settlements); Perak, Selangor, Negri Sembilan, and Pahang (formerly the Federated Malay States, under British protection and administration); Kedah, Kelantan, Trengganu, Johore, and Perlis (formerly unfederated states under British protection). The capital is Kuala Lumpur. Area 50,690. Pop. (1956 est.) 6,280,000, of whom 40 p.c. are Malays; 40 p.c. Chinese; 10 p.c. Indians.

The possessions of the E. India co. in Malaya became a crown colony in 1867; the federated states, each of which retained its Malay ruler, came under British administration between 1888 and 1896, in which year they were federated under a British resident-general; Johore came under British protection in 1819 when Singapore was founded; the other states passed from Siamese to British suzerainty by a treaty of 1909.

During the Second Great War the Japanese attacked Malaya Dec. 8, 1941. Forces which had been massed in French Indo-China landed in Siam and Kelantan. Air raids by the greatly superior Japanese air force on Malayan airfields and on Penang followed;



Malaya. Map of the Malayan Federation: it includes the former British Straits Settlements, the federated, and the unfederated Malay states

while the sinking by air attack of H.M.S. Prince of Wales and Repulse in the Gulf of Siam destroyed British capacity to prevent at sea the passage of Japanese troop convoys. The Japanese advanced down the peninsula in a three-pronged drive, with troops trained to a very high standard of jungle fighting. British, Australian, and Indian troops resisted stubbornly; but by the second week in Jan., 1942, the Japanese had reached Kuantan on the E. coast, and Kuala Lumpur in the W. On the night of Jan. 30-31, all Empire troops were withdrawn to Singapore I., on the N. coast of which the Japanese landed Feb. 8. On Feb. 15 Lt.-Gen. A. E. Percival surrendered, and the whole of Malaya was in Japanese hands.

Japan set up a combined state of Malaya and Sumatra with its capital at Singapore, renamed Shonan (Light of the South), and in July, 1943, agreed to the annexation by Siam of Kedah, Perlis, Kelantan, and Trengganu. British forces reoccupied Singapore Sept. 5, 1945.

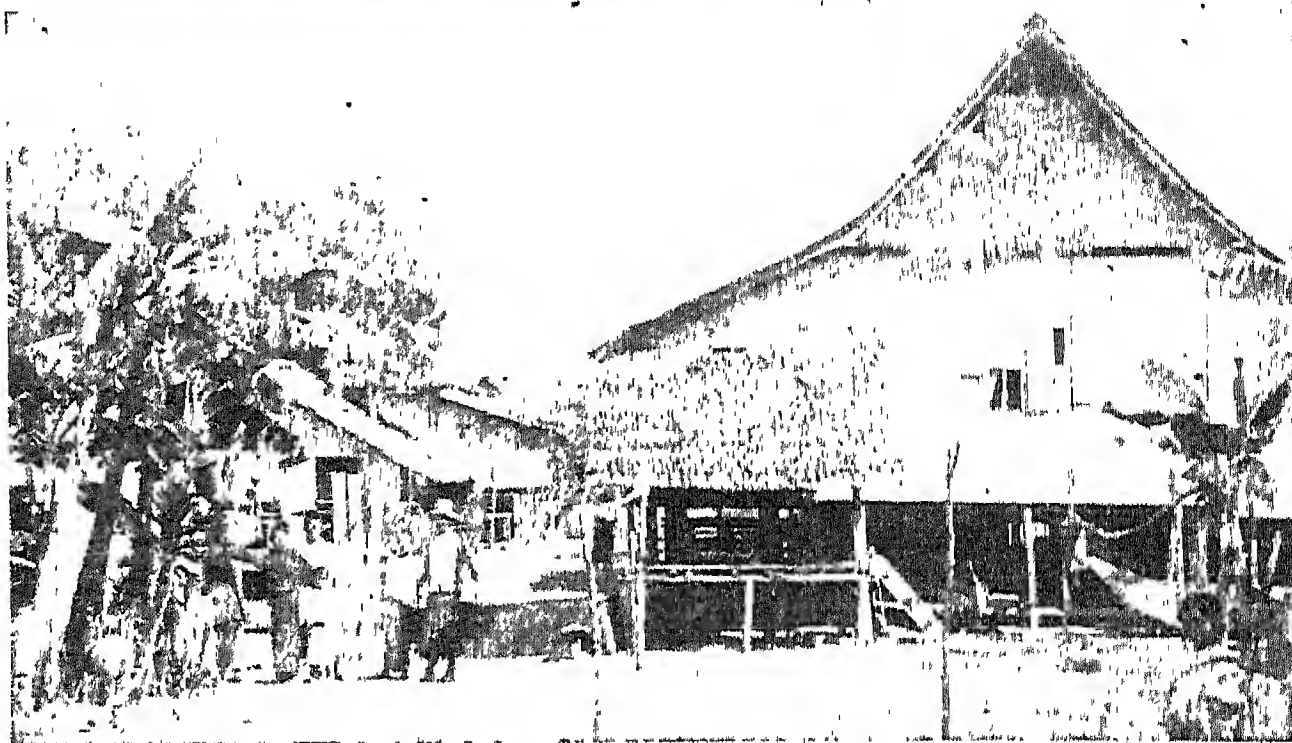
A month later, Oct. 10, the secretary for the Colonies announced in the house of commons a scheme for a Malayan Union comprising the federated and unfederated states and the British territories of Penang, Province Wellesley, and Malacca, Singapore becoming a separate colony. An agreement with the Malay rulers was reached which set up on Feb. 1, 1948, the Federation of Malaya with a central govt., under a British high commissioner. The government was composed of a federal executive council and a federal legislative council.

A period of internal unrest followed; outrages by members of the "Malayan People's Anti-Japanese army" (originally a Communist resistance army formed during the war by Chinese residents in Malaya), were numerous, and the terrorist groups, with h.q. in the jungle, proved very difficult to suppress. But repressive measures against the bandits of the jungle, coupled with the resettlement of terrorised villagers, gradually brought something like order to the

country. In 1956 the federation was given internal self-government. An act passed by the imperial parliament in 1957 conferred full independence on it, as the Malayan Federation, on Aug. 31, 1957. The constitution provided that the Malay rulers should in turn be head of state for five years; and that there should be a cabinet and a prime minister; and a parliament consisting of a senate, part elected, part appointed by the head of state, and a house of representatives elected by universal suffrage of citizens over 21. Citizens were all those born in the federation before Aug. 31, 1957, provided they had lived within it for five out of the previous seven years; and those living in the federation on Aug. 31, 1957, but not born there, provided they had lived in Malay for eight years out of the previous 12, and were acceptable to the responsible minister. *Consult* British Malaya, F. Swettenham, 1929; Malaysia, R. Emerson, 1937; Malaya, G. Hawkins and C. A. Gibson-Hall, 1952; Malaya and its History, R. Winstedt, 3rd ed., 1953.

Malay Archipelago. Variant name for the East Indies, the islands largely peopled by Malays, and lying near the Malay Peninsula. The larger islands, Borneo, Sumatra, and Java, stand on the Sunda continental shelf, which extends S.E. from Malaya and Cochin China at a depth of less than 250 ft. Celebes and the smaller islands to the S. and E. are the tops of submarine ridges which rise between deep basins, such as the Flores, Celebes, and Banda Seas, each more than 16,000 ft. below sea level. *See* Indonesia.

Malay Peninsula. Long, narrow peninsula in S.E. Asia, extending from the isthmus of Kra to Singapore. Its length is 700 m. and its maximum breadth 180 m. The Strait of Malacca separates it from Sumatra; on the E. is the China Sea. It includes the southern part of Siam. The backbone of the peninsula is a system of granitic forested mountains, with peaks, Yong Blar, Ulu Temengor, etc., exceeding 7,000 ft. in alt., and in general the ridge forms a political boundary. On the E. side the chief rivers, the Kelantan, Trengganu, and Pahang, form extensive basins, each comprising almost precisely a separate state; the separating ridge N. of the Pahang runs almost E. to W., and rises in Tahan to 7,186 ft. The rivers on the W. are shorter, the Perak being the longest; the



Malaya. Village scene in Pahang, Malaya, showing the native system of building on piles

Krian, Bernam, Sepang, and Kesang are political frontiers.

The coasts are usually swampy and mangrove-lined. The forests yield ebony, teak, sandalwood, and camphor; tin is mined in considerable quantities; gold is worked, and other ores exist; rubber is the most important export crop, rice the chief food grain. Elephants, rhinoceros, and seladang (*Bos gaurus*) are hunted; monkeys, snakes, tigers, leopards, lizards, and beautiful birds are found in the forest. Natural resources are exploited by Chinese and Tamil immigrants. The native Malay is content with the minimum of toil necessary to supply his scanty needs. A trunk rly. connects Singapore with Siam.

Malaysia. Name sometimes used to describe the Malay Peninsula and Archipelago as a whole.

Malbork. Polish name for the city of Marienburg (*q.v.*).

Malcolm (Gael., tonsured one of Columba). Name of four kings of Scotland, and since their time a popular Christian name.

Malcolm I (d. 954), son of Donald VI, succeeded Constantine II in 943. He was friendly with Edmund I of England, who conquered the kingdom of Strathclyde or Cumbria, and granted it to Malcolm on military tenure. The latter fell in a border skirmish.

Malcolm II (d. 1034), son of Kenneth III, contested the crown with his cousin Kenneth IV, and succeeded to it when his rival was killed in battle in 1005. In 1018 he conquered Lothian and the part of Cumbria N. of the Solway, but did

homage in 1031 to Canute. He was succeeded by Duncan I.

Malcolm III (c. 1025-93), son of Duncan I, fled when his father was slain by Macbeth in 1040 to



Malcolm III, King of Scotland

his uncle Siward, earl of Northumberland, who in 1054 put him in possession of Lothian and Cumbria. Three years later Malcolm slew Macbeth, and was crowned

at Seone. About 1067 he married Margaret, sister of Edgar Atheling, supported his brother-in-law's claims, and invaded Northumberland five times. In 1092 he lost Cumberland, and on Nov. 13, 1093, he was treacherously slain with his eldest son Edward by Robert de Mowbray, earl of Northumberland, at Malcolm's Cross near Alnwick. Margaret, afterwards canonised, died a few days later. Malcolm, known as Canmore or Great Head, left four sons who succeeded him in turn; one daughter, Matilda, married King Henry I. *See* Macbeth.

Malcolm IV (1141-65), styled the Maiden, succeeded his grandfather David I, May 24, 1153. His reign was disturbed by revolts in Gallogway and Moray, and by two risings of Somerled, lord of the Isles. He placed himself in 1157 under the protection of Henry II of England, to whom he surrendered Northumberland and Cumbria, and was confirmed in the earldom of Huntingdon. He accompanied



Malcolm IV, King of Scotland



Malcolm I, King of Scotland

the English army to Toulouse in 1159. He died Dec. 9, 1165.

Malda. District and town of India, in West Bengal, in the Presidency division. The district lies E. of the Ganges, and is drained by the Mahananda river; four-fifths is cultivable, but only two-thirds is tilled; rice is the chief crop. The district headquarters is English Bazar. Area, 2,004 sq. m. Malda town lies E. of the Ganges, 12 m. N. of English Bazar. Pop. (1951) dist., 937,580; town, 4,500.

Malden. City of Massachusetts, U.S.A., in Middlesex co. It is a northern residential suburb of Boston and linked with it by rly. Named after Maldon, England, it was the first place to petition the colonial government to withdraw allegiance from George III. Incorporated since 1649, it became a city 1881. Manufactures include rubber boots and shoes, clothing, leather goods, paints, varnish, drugs, chemicals, and furniture. Pop. (1950) 59,804.

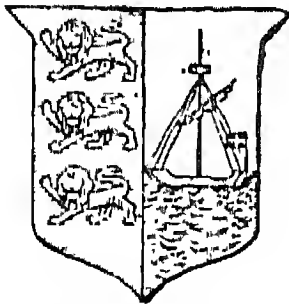
Malden and Coombe. Bor. of Surrey, England, 3 m. W. of Kingston. It is a residential suburb of London. Merton College, Oxford, was founded here in 1264 and is still in possession of property in the neighbourhood. Pop. (1951) 45,566.

Maldivé Islands. Eighteen groups of coral atolls in the Indian Ocean, 450 m. W. and S.W. of Ceylon. It is a dependency of Ceylon with an elected sultan, and came under British protection in 1887. The constitution of 1932 gave the islands a people's assembly, mainly elected, and a cabinet of four. The islands are chiefly jungle, but they are rich in coconut palms and produce millet and nuts. The people are Muslims, and are expert traders and navigators. Fishing is the chief industry. There is an airfield. Pop. (1956) 81,950. The capital is Male (pop. 8,000) on King's I.

A British naval base, called Port T, was set up in 1941 for fuelling and watering war-time convoys proceeding to the Far East and Australia.

Maldon Mun. bor., seaport, and market town of Essex, England. It stands on the Chelmer estuary, 44 m. N.E. of London. It is served by rly. and has a shipping trade. Brewing, making agricultural implements, and fishing occupy the people. The chief buildings are All Saints' church, an Early English building with a triangular tower and hexagonal spire, which was restored as a

memorial to Washington; S. Mary's church: a 16th century grammar school; a 15th century town hall, originally D'Arcy tower; and a modern public hall. Maldon was a town, presumably important before the Norman Conquest. It



Maldon arms

received a number of charters granting privileges to the citizens, and gives its name to a county constituency. Roman remains have been found in the neighbourhood, and near are the ruins of Beeleigh Abbey. Market day, Thurs. Pop. (1951) 9,721

Maldon, THE BATTLE OF. An Anglo-Saxon poem of the 10th century. It describes the fight between Norse invaders under Olaf Tryggvason, later king of Norway, and the East Saxon ealdorman Byrhtnoth, who fell in this battle, in 991. It is known only in a spirited fragment of 600-700 lines, from a MS. destroyed in the fire at the Cotton Library, 1731. The text appears in H. Sweet's Anglo-Saxon Reader, and a verse translation by Lt.-Col. Lumsden was published in Macmillan's Magazine, March, 1887.

Maldonado. Maritime dept. of S. Uruguay, fronting the Rio de la Plata. Mainly level country, except in the N., the soil is fertile, and agriculture and stock raising are largely engaged in. Maldonado, the capital, on the coast, 30 m. E. of Montevideo, was founded in 1757 and has a fine harbour, sheltered by the island of Goriti at its entrance. It is a naval station, fortified, and a seaside resort. Regularly planned, with a fine plaza, it exports cattle, hides, wool, grain, and limestone. Area, 1,587 sq. m. Pop. (est.) 69,000.

Malebranche, NICOLE (1638-1715). French philosopher. Born in Paris, Aug. 6, 1638, he joined



Nicole Malebranche, French philosopher

the Oratorians, and studied the Church fathers and historians, afterwards turning to philosophy. His chief works are *The Search after Truth*, 1674, Eng. trans. 1694, and *Entretiens sur la Métaphysique*, 1688. Died Oct. 13, 1715.

His philosophy is founded upon that of Descartes, but he refuses to admit the existence of innate ideas. He asserts that we see all things in God, since God, as the place of spirits, contains our spirit in Himself. He denies the action of the soul upon the body, seeing in their movements only "occasional" causes. Neither our will nor our intelligence can do anything alone; it is God that decides our actions. A study of his philosophy by R. W. Church appeared in 1931.

Male Fern (*Dryopteris filix-mas*). Fern of the family Polypodiaceae. A native of the temperate regions of the N. hemisphere, and of India and Africa, it has a solid woody rootstock formed of the bases of decayed fronds. The lance-shaped fronds are, in well-developed plants, 3-4 ft. long; the leaflets or pinnac tapering to a point and deeply cut into lobes. The lower part of the stock is densely clothed with pale brown scales, which appear more sparingly on the upper portion. The clusters of spore-cases are found in two brown lines on the back of the lobes. The rootstock contains an oil used as a vermifuge. The name indicates its robust habit. See Fern illus.



Maldon, Essex. Picturesque street in this small but ancient market town and port on the estuary of the river Blackwater

Malenkov, GEORGI MAXIMILIANOVICH (b. 1901). Russian politician. Born at Orenburg (Chkalov), in the



G. M. Malenkov,
Russian politician

Urals, he joined the Red army in 1919. At the end of the civil war he studied at the higher technical school in Moscow until 1925, when he took up a post in the Moscow committee of the communist party, being appointed a secretary of the party organization in Moscow in 1930. In 1934 he was appointed to supervise local party organizations and party appointments, and five years later became a member of the central committee.

When Germany attacked Russia in 1941 Malenkov was made one of the five "war cabinet" members, being responsible for aircraft production and later for the rehabilitation of liberated territory and the direction of heavy industry. He organized political work at Stalin-grad during its siege. He was made deputy chairman of the council of ministers in 1946.

A protégé of Stalin, whose private secretary he had been, Malenkov succeeded to the premiership of the U.S.S.R., March 6, 1953, the day after Stalin's death; and the first actions of his govt. seemed designed to relax the tension between Russia and the West. He resigned the premiership Feb. 8, 1955, and was expelled from the C.P. central committee in 1957.

Malesherbes, CHRÉTIEN GUILLAUME DE LAMOIGNON DE (1721-94). French royalist and advocate. Born in Paris, Dec. 6, 1721, he became counsellor to the parliament of Paris, and succeeded his father in 1750 as president of the Cour des Aides, in which capacity he addressed himself to the abolition of official abuses. As press censor he permitted a wide latitude. In 1771 his condemnation of legal abuses ended in his being banished to his estates. On the trial of Louis XVI by the Convention, when all others had deserted the king, he undertook to defend him. For this he was marked down by the revolutionists, and was arrested and guillotined in Paris, April



C. G. de Malesherbes,
French royalist

22, 1794. His fearless devotion to duty has become almost proverbial. *Pron.* malzayrb.

Malet, LUCAS. Pen-name of Mary St. Leger (1852-1931), British novelist, younger daughter of Charles Kingsley (*q.v.*). She was born at Eversley, and educated at University College, London; and in 1876 married William Harrison (d. 1897), rector of Clovelly. She published her first novel, *Mrs. Lorimer*, in 1882, and established herself as a best-seller with *The Wages of Sin*, 1891. Her other books included *Colonel Enderby's Wife*, 1885; *The Gateless Barrier*, 1900; *History of Sir Richard Calmady*, 1901; *The Golden Galleon*, 1916; *The Tall Villa*, 1920; *The Dogs of Want*, 1924. She died Oct. 27, 1931.

Malham. Village and parish of the W. Riding of Yorkshire, England. On the Aire, it is 6 m. E. of Settle. About a mile from the village are Malham Cove and Gordale Scar, two precipitous amphitheatres of rock 300 ft. in height, produced by the vast displacement of the mountain limestone called the Craven Fault. N. of the cove is Malham Tarn, a secluded upland lake about 3 m. in circumference, the property of the nation. Charles Kingsley wrote part of *Water Babies* at Malham House near by. Pop. (1951) parish, 171. See Aire illus.

Malherbe, FRANÇOIS DE (1555-1628). A French poet. Born at Caen, July 13, 1555, he lived for some years at Aix, where he married Marie de Coriolis in 1581. About 1605 he began to enjoy court favour under Henry IV, and continued his successful career under



François de Malherbe,
French poet

Louis XIII. Deeply affected by the death of his son in a duel, 1627, commemorated in a fine sonnet, he died in Paris, Oct. 16, 1628. Malherbe's work was chiefly done in his later years, addressed to court patrons or celebrating public events. The odes and stanzas are laboriously finished and technically correct, but lack poetic inspiration. He attempted to rid literary French of all words that might reduce its clarity, *e.g.* technical, foreign, and dialect terms. His rules for poetry, especially those relating to versification, had a profound effect on its development for more than a century. Notable

among his writings was his *Consolation à M. du Périer*, 1602.

Mali (Skt., garland). Indian gardener caste. The Marathi name is Marar. Numbering some two millions, they are small and dark. Their earliest occupation was growing flowers for use in Hindu ritual, and in modern times they have virtually monopolised market-gardening from the Punjab to Mysore.

Malibran, MARIA FÉLICITÉ (1808-36). French opera singer. Born in Paris on March 24, 1808,



M. F. Malibran,
French singer

she was a daughter of the singer Manuel Garcia (*q.v.*), was trained as a singer in Italy, and made her first appearance in *The Barber of Seville*, in London, 1825. After an instant success she went with her father to America, where she made an unhappy marriage with a French merchant, and in 1827 returned to sing at the Théâtre des Italiens in Paris. Gifted with powers of acting as well as a fine voice, she was one of the most popular singers of her day. Divorced from Malibran, she married Charles de Bériot, a Belgian violinist, 1835. She died in Manchester, Sept. 23, 1836, at the age of twenty-eight.

Malic Acid. Substance discovered by Scheele in 1785, in gooseberries and unripe apples. It has subsequently been shown to be widely distributed in the juices of plants, and may be prepared from the berries of mountain ash (*Sorbus aucuparia*), collected just before they begin to redden. The juice of the berries is expressed, milk of lime added, and the calcium malate, which separates as a white sandy powder, is collected, washed, and decomposed with hot dilute nitric acid. On cooling, the malic acid crystallises out. Chemically it may be obtained by partial reduction of tartaric acid or by the catalytic oxidation of benzene.

Malice. Term used in English law. It may mean either actual ill-will formed against another in the mind of the person charged with malice; or the doing of some kind of deliberate act so injurious to another that the law will imply evil intent. Thus in murder, malice aforethought is required; this has a technical meaning, including not only the deliberate intent to kill the murdered person, but also

the making of a "suicide pact" or the infliction of a wound likely to cause death or grievous bodily harm, even though neither was intended.

In libel, the deliberate act of writing causes the law to presume malice; but not so in slander. When a libel or slander is proved to have been written or uttered on a privileged occasion, *e.g.* when giving a servant's character, express malice must be proved. It used to be thought that an act lawful in itself might become unlawful if it were done maliciously, but the house of lords repelled this doctrine in the trades union case of *Allen v. Flood*, 1898. See Libel; Slander.

Malicious Damage. A legal term meaning damage done to property wilfully and purposely, as distinct from an act done in ignorance or by accident. If, in order to assert a claim of right, damage is done to property, it is not malicious unless the damage done is in excess of what was necessary to assert the claim. Sometimes malicious damage is a felony, *e.g.* damage to sea-walls, canals, reservoirs, docks, etc., sometimes merely an offence punishable by fine by a magistrate's court.

Malicious Prosecution. Term used in English law for the preferring of a criminal prosecution, or the presentation of a bankruptcy petition, maliciously and without reasonable or probable cause. In an action for damages for such a prosecution the plaintiff must

prove a negative, namely, that there was no reasonable or probable cause for the prosecution, and this is to be decided by the judge and not the jury. He must also prove that he was acquitted of the charge, and that the prosecutor acted maliciously, *i.e.* not in exercise of a real right, and not honestly, but from temper, or from actual ill-will. See Malice.

Malignant Disease (Lat. *malignus*, evil). Term applied to any virulent manifestation, usually ending fatally, of a disease ordinarily simple, *e.g.* scarlet fever; but a cancerous growth of some type is usually understood. This is characterised by rapid progress, power to infiltrate into neighbouring tissues, and a tendency to form secondary deposits in other organs, the cells being carried by the lymphatic or blood stream; also by its termination in the death of the victim.

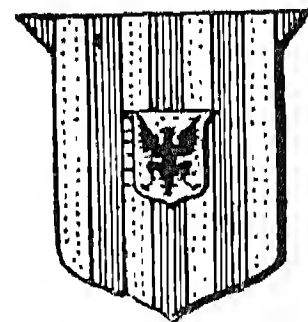
Malignant Pustule. Name for the boil-like sore which marks the site of entrance of the bacillus of anthrax (*q.v.*).

Malignants. Term first used by the parliamentarians, as in the Grand Remonstrance, of the advisers of King Charles I in his

struggle with parliament. Strafford and Laud were named as the chief of these malignants. Eventually the term came to be applied to all supporters of the king.

Malindi. Harbour in Kenya Colony. It is 66 m. N.E. of Mombasa by sea, at the mouth of the Sabaki river. The town was once the capital of Portuguese E. Africa, and during the Arab period was of considerable importance. Rubber is cultivated in the area; from the port maize, copra, and cotton are exported.

Malines or MECHLIN (Flemish, *Mechelen*). Fifth town of Belgium, in the prov. of Antwerp. It is 13 m.



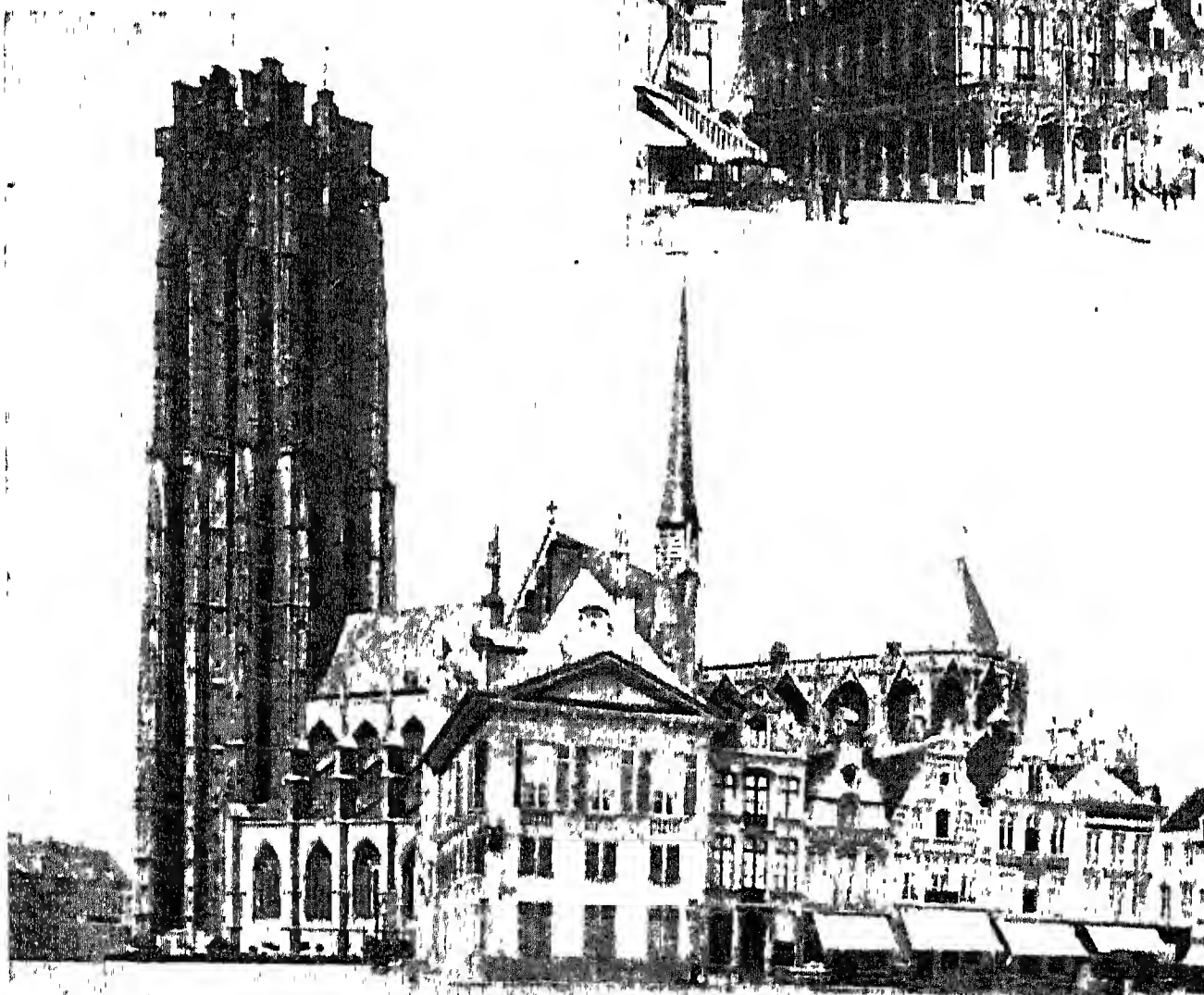
Malines arms

by rly. N.N.E. of Brussels, and lies in flat country on the river Dyle, the branches of which intersect the town. It is a busy rly. junction, with extensive rly. engineering sheds, and has furniture making, printing, and carpet and lace making, and other textile industries, but is best known as the ecclesiastical capital of Belgium and seat of the archbishop-primate.

The cathedral of S. Rombold is a noble Gothic building, built about 1300-12, but remodelled during the 14th-16th centuries. The great W. tower (318 ft.), begun in 1452, was never completed. The interior contains a large altarpiece by Van Dyck and other pictures. Among

many churches are those of S. John, 15th century, and Notre Dame, founded 1255 and rebuilt in the 16th century, both containing paintings by Rubens, and the Baroque churches of Notre Dame du Val-des-Lis, 1662-1715, the Grand Béguinage, Notre Dame d'Hanswyk, and SS. Peter and Paul, 1677. The palais de justice is a picturesque group of Gothic and Renaissance buildings. On the Grande Place, with characteristic Flemish gabled houses, stands the Cloth Hall, completed 1326 (now town hall).

After Charlemagne, Malines came to Lotharingia 915, under the rule of the bishops of Liège. Having developed a certain strength and independence, and fought the count of Flanders to whom the bishop had ceded his rights, it was



Malines, Belgium. Cathedral of S. Rombold, 14th-16th cent. Top, Cloth Hall; right-hand part 14th cent., left-hand Gothic part rebuilt after 1918 from a 16th cent. design

incorporated with Burgundy in 1384. A period of prosperity followed, and under Margaret of Austria as *stadtholder*, Malmes was the virtual capital of the Netherlands, 1507-30. In 1559 it became the seat of an archbishop. A famous holder of that office was Cardinal Mercier during the First Great War. The town suffered several bombardments during both Great Wars, but its main treasures survived. In the Second Great War, it was liberated by the British without fighting on Sept. 4, 1944, during their spectacular week's advance from the Seine to Antwerp. Pop. (1955 est.) 63,300.

Malingering (Fr. *malinyre*, sickly). Feigning illness, either from hysteria, or from the hope of escaping disagreeable duty as in war, or in postponing return to work in the hope of drawing compensation pay. There is generally some basis for the symptoms complained of. In cases associated with payment of compensation, the cure is often the settling of the claim. The experienced consultant, by reason of knowledge of his special branch of medicine, and by the use of instruments, can usually decide whether the symptoms recounted are possible or probable or inconsistent with known medical facts.

Malinowski, BRONISLAW (1884-1942). A British anthropologist. Born in Cracow, April 7, 1884, he studied at the universities of Cracow and Leipzig, and at the London School of Economics. From 1914 onwards he visited New Guinea, N.W. Melanesia, and S. and E. Africa where he carried out research among native tribes. His studies of the ethnology and ethnography of the Mexican Indians emphasised the cultural effect on primitive tribes of their contacts with more advanced peoples. He later adopted British nationality and eventually became one of the world's leading anthropologists. He left England in 1939 to become professor of anthropology at Yale, dying at New Haven, Conn., U.S.A., May 16, 1942. His many books include: *The Family Among the Australian Aborigines*, 1913; *Argonauts of the Western Pacific*, 1922; *Myth in Primitive Psychology*, 1926; *Sexual Life of Savages in N.W. Melanesia*, 1929; *The Foundations of Faith and Morals*, 1936.

Malinowsky, RODION YAKOV-LEVITCH (b. 1899). A Russian soldier. Born in Odessa of peasant stock, he served in the First Great War in a Russian brigade in

France, and was a corporal when in 1917 he joined the revolutionaries. He returned to Russia



R. Y. Malinowsky,
Russian soldier

and became an officer in the Red army; despite a short spell of retirement, he rose to the rank of major-general, and in 1939 was commanding the Soviet 6th army. His forces fought a successful delaying action on the Dnieper in 1941, and defeated the German efforts to relieve Stalingrad in 1942. In 1943 he commanded the troops which reoccupied Rostov; he took part in the fighting in the Ukraine, and entered Bucharest, Aug., 1944, where he signed the United Nations' armistice with Rumania. He was promoted colonel-general and general of army in 1943, and marshal of the Soviet Union in 1944. His troops led the drive through Hungary into Austria, 1944-45. In 1941 he received the Order of Lenin, in 1943 that of Suvorov. In 1957 he was made minister of defence.

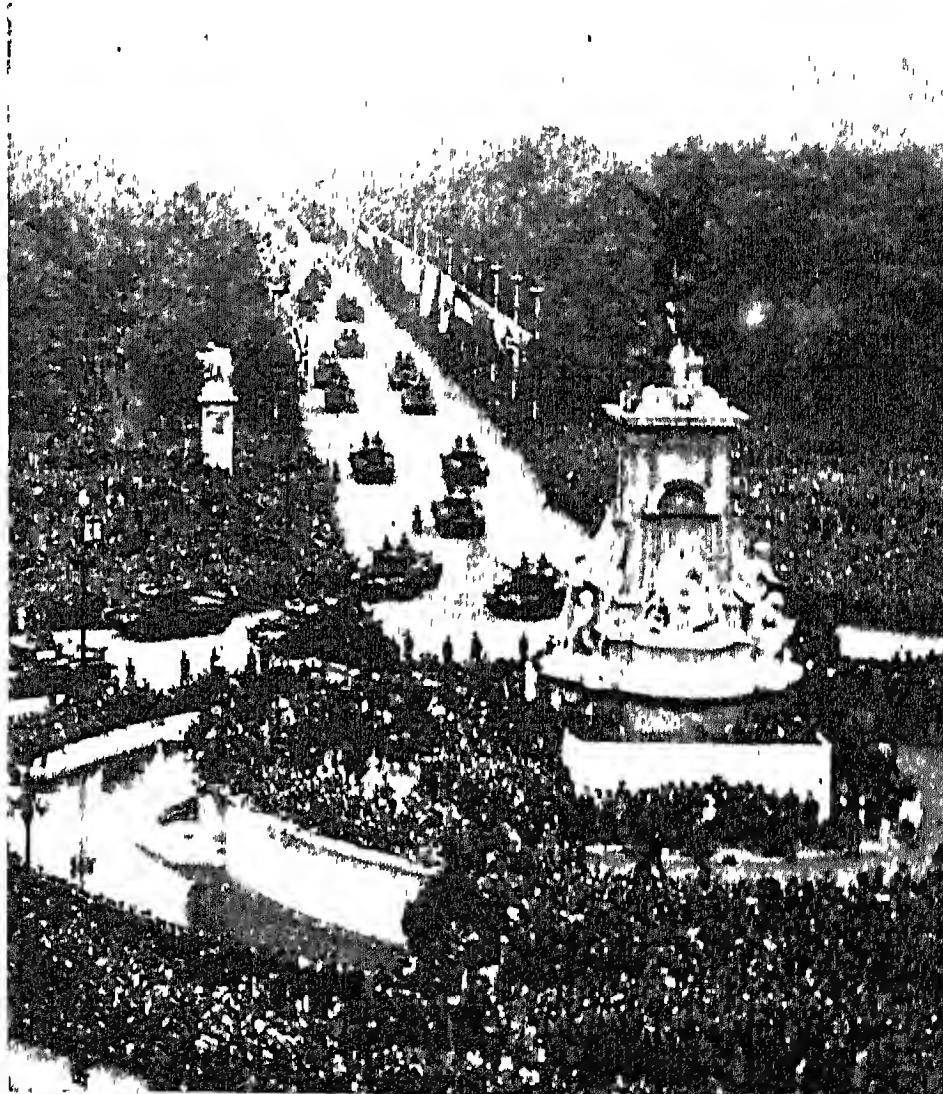
Mall, THE. London thoroughfare. A tree-lined avenue, it runs along the N. side of St. James's Park between Admiralty Arch at Charing Cross and the Queen Victoria Memorial in front of Buckingham Palace. It is used on state occasions as a processional route, and, like Pall Mall (*q.v.*),

derives its name from the game of paille-maille, or pell-mell, played here in Charles II's time. It has on the N. the gardens of Carlton House Terrace, the Duke of York's Steps leading to Waterloo Place, and the gardens of Marlborough House, St. James's Palace, and Lancaster House. See Admiralty Arch; St. James's Park.

Mallaby-Deeley, SIR HARRY (1863-1937). British financier and politician. Born Oct. 27, 1863, son of W. C. Deeley, he was educated at Shrewsbury and Trinity College, Cambridge. He added the surname of Mallaby in 1922.

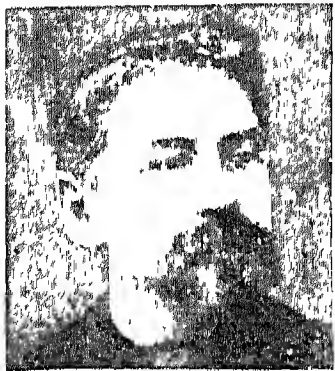
He was a prominent financier and a dealer in real estate. Among his extensive financial operations was the purchase from the duke of Bedford of Covent Garden, 1913, for a sum exceeding £1,750,000. Shortly after the First Great War, when tailoring prices appeared excessive, he promoted a scheme for the retailing of men's ready-made suits at a low price: an enterprise reputed to have cost him £60,000; his tailoring shop in the Strand was well known. Conservative M.P. for Harrow, 1910-18, and E. Willesden, 1918-22, he was created a baronet in 1922. He died Feb. 4, 1937.

Mallard. Common wild duck of Great Britain and the N. hemisphere. In the male the head and neck are glossy green, the breast chestnut, the underparts greyish white, and the wings reflect a metallic violet hue. The beak is greenish yellow, the legs and feet red. After the breeding time the colours are less bright. The female is smaller and has mottled brown and buff plumage. The mallard breeds in most retired districts of Gt. Britain that are near to water; but great numbers are winter migrants. It feeds upon plants, snails, worms, and insects, and usually nests in a hollow of the ground near the edge of a river or pond, but sometimes in a tree. Most of the domesticated ducks are descended from the mallard. See Duck.



The Mall, London. View along the avenue from Buckingham Palace, on the occasion of the Victory Parade, June 8, 1946. In the foreground is the Queen Victoria memorial

Mallarmé, StÉPHANE (1842-98). French poet. Born in Paris on March 18, 1842, Mallarmé was



Stéphane Mallarmé,
French poet

educated at Auteuil and Sens, and spent some time in England. From 1862 onwards he published poems in various reviews, translated E. A. Poe's *The Raven*, 1875, other of Poe's poetry in 1888, issued his beautiful *L'Après-midi d'un Faune* in 1876, and collected poems in 1887. The recognized leader of the Symbolists, Mallarmé exercised great influence on the rising generation of French poets. After his retirement from teaching in 1892, he published *Vers et Prose*, 1893, and *Divagations*, 1897. He died at Valvins, near Fontainebleau, Sept. 9, 1898. His *Vers de Circonstance*, a collection which shows his delicate craftsmanship, appeared in 1920. Consult *French Profiles*, E. Gosse, 1905; *The Symbolist Movement in Literature*, A. Symons, 2nd ed. 1908.

Malleability. A physical property. Malleable materials can be deformed permanently in all directions normal to a permanent compression strain without any rupture of the material.

This property is particularly important in such processes as the forging, pressing, and rolling (*q.v.*) of metals and metal alloys, many of which are malleable in varying degrees. Probably the most malleable metal is gold which can be hammered out to thicknesses of the order of one-300,000th part of an inch. Some metals are malleable only at temperatures above their recrystallisation temperature (*q.v.*) and a few only at temperatures below their recrystallisation temperature, the former because of cold shortness and the latter because of hot, or red, shortness. Some metals and materials are malleable only over a very limited range of temperature.

Malleco. Inland province of Central Chile. It is bounded E. and N. by the prov. of Biobío, and S. by Cautín. The chief products are wheat, timber, and cattle. Gold is found. The capital is Angol, 70 m. by rly. S.S.E. of Concepción. Area, 5,511 sq. m. Pop. (1952) 159,419.

Mallee Scrub (*Eucalyptus dumosa*). Species of eucalyptus, a native of Australia. The root forms

a flat disk about 3 ft. across and 8 or 10 ins. thick, known to the colonists as a "scab." From its underside numerous rootlets descend until they reach moisture, often to a depth of over 30 ft. From the upper side there are many slender stems 14 or 15 ft. long, bearing dense clusters of leaves at the summits. The scrub extends monotonously over many miles of the dry plains, but the rootlets, cut into lengths, yield a supply of drinkable fluid.

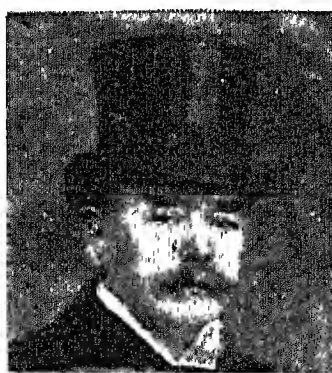
Malleson, (WILLIAM) MILES (b. 1888). British actor. Born at Croydon, Surrey, May 25, 1888, he went to Emmanuel, Cambridge, then studied at the R.A.D.A. He made his first stage appearance at Liverpool, 1911, his first London appearance 1913. He was specially successful in Shakespearian comedy parts, *e.g.* *Aguecheek*, *Quince*, *Polonius*. A member of John Gielgud's co., 1944-45, he also had several seasons with the Old Vic co. His English versions of Molière's *L'Avare* (*The Miser*) and *Tartuffe* were put into the Old Vic repertory. He also appeared with success in films, *e.g.* *Kind Hearts and Coronets* and *The Captain's Paradise*.



Miles Malleson,
British actor

Malling. Name of a parish and market town and of a village in Kent, England. West Malling, or Town Malling, is 5 m. W. of Maidstone, on the Pilgrims' Way (*q.v.*), with a rly. station. It is notable for the ruins of an abbey founded for a community of Benedictine nuns by Bishop Gundulf in 1090, and partly rebuilt in 1738. Near by is St. Leonard's Tower, built about 1070. The village of E. Malling has an old church. For the horticultural research station, see East Malling.

Mallock, WILLIAM HURRELL (1849-1923). British author. A nephew of J. A. Froude, he was educated privately and at Balliol College, Oxford.



W. H. Mallock,
British author

He first attracted attention with a semi-philosophical satire. *The New Republic*, 1877. Later books, aiming at exposing the fallacies of radical, socialist, and

secularist ideas, include *Social Equality*, 1882; *Labour and the Popular Welfare*, 1893; *Aristocracy and Evolution*, 1898; *Social Reform*, 1914; and *The Limits of Pure Democracy*, 1918. He also wrote novels and *Memories of Life and Literature*, 1920. He died, April 2, 1923.

Mallory, GEORGE LEIGH (1887-1924). British mountaineer. A member of the Everest expeditions of 1922 and 1924, he lost his life in an attempt with Andrew Irvine to reach the summit. They were last seen at 28,239 ft. on June 8. It is not known if they achieved their object before they died. (*Consult The Epic of Mount Everest*, Sir F. Younghusband, 1926.) Sir Trafford Leigh Mallory (*q.v.*) was a younger brother.



G. L. Mallory,
British mountaineer

Mallow (*Malva*). Genus of herbs of the family Malvaceae. They are natives of Europe, temperate Asia, and N. Africa. They have large, lobed, or divided leaves, and showy rose, purple, or white flowers. The fruit is a ring of large seeds, each in a leathery shell. The common mallow (*M. sylvestris*) has a stem two or three ft. in height, with lobed leaves and blue-purple flowers. Musk mallow (*M. moschata*) has the leaves divided into slender segments, and pale rosy flowers. Marsh mallow (*Althaea officinalis*) belongs to a separate genus which includes the hollyhock.

Mallow. Market town, urban dist., and resort of co. Cork, Irish Republic. It stands on the Blackwater, 21 m. from Cork, with a station on the state rly. It has a mineral spring, for which there is a pump-room, and there are ruins of a castle once belonging to the Desmond. The industries are tanning and milling, while the town is the centre for an agricultural district and for salmon fishing. It has a large sugar-beet factory, with 1,000 employees. The town was seriously damaged by fire in Sept., 1920, as the result of reprisals for the action of some insurgents who raided the barracks and shot dead a sergeant of the 17th Lancers. The shooting of several railwaymen here in Jan., 1921, led to the threat of a rly. strike in England, averted by the appointment of a military court of inquiry. Market days, Tues. and Fri. Pop. (1951) 5,564.

Malm. Geological term used in Germany to denote the Upper Jurassic beds—Oxford Clay to Purbeck. See Jurassic System.

Malmaison. Château of France, in the dept. of Seine-et-Oise. It lies 4 m. S.E. of St. Germain-en-Laye, and 6 m. by tram from Paris. The château, dating from the early 17th century, but rebuilt under Napoleon I, is famous as the residence of the Empress Josephine (*q.v.*), who died here in 1814. For some years the property of Queen Christina of Spain, it was bought by Napoleon III. In 1900 it was given to the nation by D. Osiris.

Malmédy. Town and district of Belgium. The town is 25 m. S. of Aix-la-Chapelle on the river Warche, and lies amid steep, wooded hills. It has a population of 5,000, mostly Walloons, who are chiefly employed in tanneries and paper mills. The dist. covers an area of 318 sq. m., with a pop. of 37,000, of whom 9,500 are Walloons. The staple industry is dairy farming. With the adjoining dist. of Eupen (*q.v.*), Malmédy was given to Prussia in 1814. By the treaty of Versailles, 1919, Germany renounced in favour of Belgium all rights and title over the two dists., in which a plebiscite was permitted. Only 62 persons voted against annexation, of whom 43 were German officials, and Malmédy was reunited to Belgium in Sept., 1920.

Malmédy was occupied by the Germans on May 10, 1940, and on May 18 was reincorporated into Germany. The town, liberated by troops of the U.S. 1st Army on Sept. 12, 1944, was hotly contested during the German Ardennes offensive in Dec., being severely bombed in error by U.S. aircraft while actually occupied by Allied forces. The Germans failed to retake the town. See map in p. 566.

Malmesbury. Borough and market town of Wiltshire. It stands on the Avon, 17 m. W. of Swindon. The chief building is the church of S. Mary and S. Aldhelm, which was part of the church of a Benedictine abbey. Mainly 12th-century, it is noted for its beautiful Norman porch. There is a market cross of the 16th century in the market place. The town has a trade in agricultural produce, and has factories manu-

facturing electrical and electronic equipment.

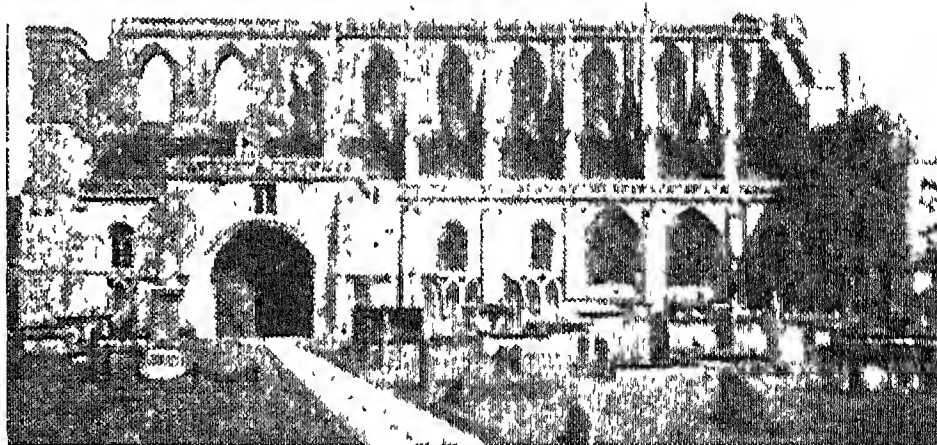
Malmesbury grew up round the abbey, which developed from a hermitage founded by an Irish missionary named Maildulf, hence Malmesbury. The magnificent monastic buildings, of which little remains, were erected about

this time, and in the 12th century a castle was built here. Malmesbury was long known for its manufacture of cloth. Fairs and markets were granted to the citizens, and the town was separately represented in parliament, 1295-1885. Pop. (1951) 2,509.

Malmesbury, JAMES HARRIS, 1ST EARL OF (1746-1820). British diplomatist. Born at Salisbury, April 21, 1746, the son of James Harris, M.P. and author, he was educated at Winchester and Oxford, and in 1768 began a long diplomatic career. He was first at Madrid; was minister at Berlin, 1772-76, at St. Petersburg, 1777-83, and at The Hague, 1783-88. In 1788 he was made a baron and in 1800 an earl. He died Nov. 21, 1820, and was succeeded by his son James Edward (1778-1841). His Diaries and Correspondence were edited by the 3rd earl of Malmesbury, 1844, who also published a volume of his grandfather's letters, 1870.

Malmesbury, JAMES HOWARD HARRIS, 3RD EARL OF (1807-89). British politician. The son of the 2nd earl, he was born March 25, 1807, and educated at Eton and Oriel College, Oxford. In 1841 he entered the house of commons as M.P. for Wilton, but in the same year he became a peer. Attached to the Tory party, he was foreign minister in the short ministries of 1852 and 1858-59. From 1866 to 1868 he was lord privy seal, as he was from 1874-76. In 1884 he published his Memoirs of an Ex-Minister. He died May 17, 1889, and was succeeded by his nephew Edward James (1842-99). The 5th earl, James Edward (1872-1950), was chairman of the London Hospital Saturday fund 1921-38. His son William James (b. 1907) succeeded as 6th earl.

Malmesbury, WILLIAM OF (c. 1093-c. 1143). English chronicler. A monk of Malmesbury, he



Malmesbury, Wiltshire. The abbey from the south

passed most of his adult life there. Having studied the work of Bede, he began to write an account of the history of England, the Gesta Regum, dedicated to his friend, Robert, earl of Gloucester, the narrative being continued to 1142 in his Historia Novella. He also wrote a Gesta Pontificum Anglorum. William is probably the best extant authority for the reigns of the Norman kings.

Malmgren, FINN (1895-1928). Swedish meteorologist. Born at Falun, he became assistant professor at Borno hydrographic institute, joining Amundsen in the N. Polar basin in 1922, and later becoming meteorologist to the expedition. He was also meteorologist to Nobile in the airship Italia on the N. Pole expedition in 1928 and was injured when the Italia crashed on the ice, May 25, 1928. To bring help he and two companions set out for Cape North, but on June 15, unable to go any farther, he induced his companions to go on without him. As a memorial of this sacrifice a professorship was founded at Uppsala university.

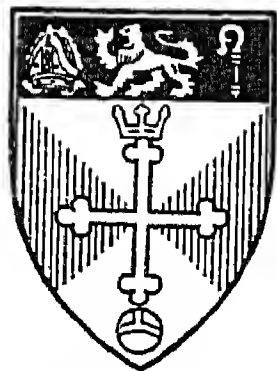
Malmö. Seaport of Sweden, capital of the län or co. of Malmöhus. It stands on the Sound,

almost opposite Copenhagen, 16 m. away. An important naval port and rly. junction, it has a castle, now partly used as a barracks. The town hall dates from



Malmö arms

1546 and the church of S. Peter from the 14th century. The harbour is capacious and well equipped with docks, warehouses, etc. There are shipbuilding yards, ironworks, and breweries, besides factories for the production of sugar, tobacco, and textiles. A large trade is carried on in timber.



Malmesbury arms

ted for its beautiful Norman porch. There is a market cross of the 16th century in the market place. The town has a trade in agricultural produce, and has factories manu-

matches, chalk, cement, and agricultural produce. Communication is maintained across the Sound by train ferries. Malmö was fortified in the Middle Ages, and, owing to its position, became an important seaport when the Baltic trade was at its height, during the Hanseatic period. Pop. (1956 est.) 209,500.

Malmöhus. A lan or co. of Sweden. The S. half of the peninsula of Scania, it is the southernmost part and one of the most fertile areas in the country. Malmö is the capital. Area 1,871 sq. m. Pop. (1955 est.) 602,000.

Malmsey. Name given to a white or red wine, originally made in Crete or other Greek islands. It was exported from Napoli di Malvasia, in the Morea, and from its medieval French name, Malvesie, the older form, Malvoisie, is derived. It is a sweet, luscious, white wine of high alcoholic content, and is now chiefly produced in the Azores, Canaries, Madeira, Sicily, and Sardinia.

Malmstone. A local variety of Upper Greensand. It is a siliceous rock, and some hard fine grained beds have been used in buildings. Other varieties have been in demand as firestones for lining limekilns, etc.

Maloja or **MALOGGIA.** Mountain pass of Switzerland in the canton of Grisons. It begins at St. Moritz, and leads to Chiavenna, in the prov. of Sondrio, Italy. Lowest of the passes between the two countries, with an alt. of 5,940 ft., it descends into the Bregaglia valley, the beginning of the Engadine.

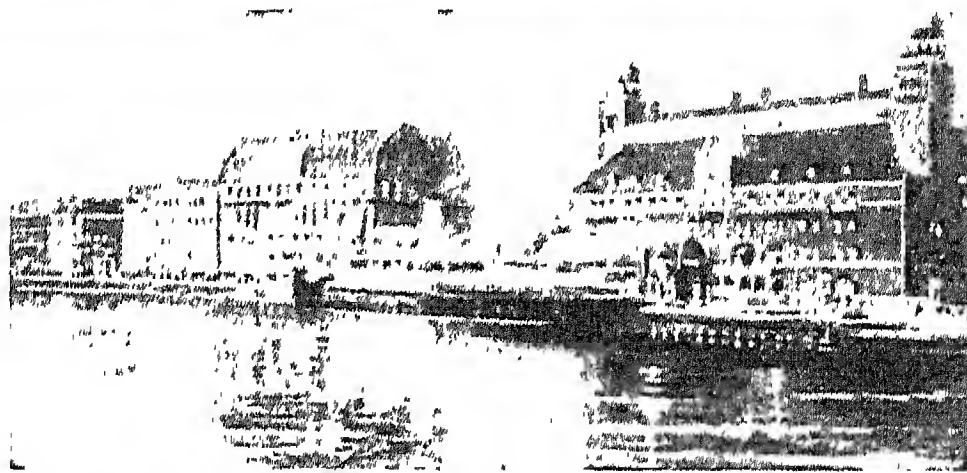
Malolos. A town of Luzon, Philippine Islands, the capital of the prov. of Bulacán. A busy trading centre, it stands on a channel of the Pampanga delta, N.W. of Manila, about 5 m. from the sea, and close to the Manila rly. Rice is the chief article of trade. Malolos was chosen as the seat of government during the revolt of the Filipinos against the authority of the U.S.A., 1898-99. Pop. est. 26,000.

Malone, EDMUND (1741-1812). British critic. He was born in Dublin, Oct. 4, 1741, and educated



Edmund Malone,
British critic
After Reynolds

at Trinity College. He settled in London in 1777, and devoted himself to literature. He died May 25, 1812. His great work is his edition of Shakespeare in 10 volumes,



Malmö, Sweden. Quays and warehouses on the inner harbour

1790. He detected the Shakespearian forgeries of William Henry Ireland (*q.v.*), and was also one of the first to deny the authenticity of the so-called Rowley poems of Chatterton (*q.v.*).

Malonic Acid. White crystalline substance discovered in 1858 by Dessaignes. He prepared it by oxidising malic acid with potassium bichromate. It is best prepared from a mixture of monochloroacetic acid, potassium carbonate, and potassium cyanide. When malonic acid is heated at a high temperature, carbon dioxide and acetic acid result. It is soluble in water, alcohol, and ether. Malonic ester, which is prepared from the acid, is an important agent used in the synthesis of organic substances.

Malory, SIR THOMAS (*fl.* 1469). English romance writer. According to Bale, he was a Welshman, but Prof. Kittridge showed, in *Who Was Sir Thomas Malory?*, that he was a knight of Newbold Revell in Warwickshire. His *Morte d'Arthur* is the most important English prose work written before the age of Elizabeth, a compilation and free translation mainly from French sources of the old Arthurian romances, arranged in more or less connected form. Finished in 1469, it was first printed by Caxton in 1485, and has been many times reprinted. The work, which has influenced poets, prose-writers, and artists from Spenser to our own time, is in 21 books. A notable modern edition is that of Oskar Sommer, 3 vols., 1889-91. See *Morte d'Arthur*.

Malot, HECTOR HENRI (1830-1907). French novelist. He was born at Rouen, May 20, 1830. In 1858 he published *Victimes d'Amour*, the first of a series of novels largely presenting the period of the Second Empire. Several of his novels were translated into English, *Sans Famille*, 1878 (Eng. trans. *No Relations*, 1880) achieving wide success. He died July 19, 1907.

Malpas. Market town of Cheshire, England. It is 13 m. S.E. of Chester, and has a rly. station. Chief building is the Perpendicular

church of S. Oswald. This was restored in the 19th century. There was a castle here in the Middle Ages, and here Reginald Heber (*q.v.*) was born. Pop. 1,101. There is a Malpas in Cornwall, 2 m. from Truro.

Malpighi, MARCELLO (1628-94). Italian anatomist. He was born March 10, 1628, near Bologna. He discovered by means of the microscope capillary circulation, blood corpuscles, and important facts relating to the skin, the kidneys, and the spleen; and he was admittedly the father of microscopic anatomy. He used this instrument also in botanical research, and his *Anatomia Plantarum* was published by the Royal Society. He wrote many treatises, the chief being *On the Lungs*; nearly all were also pub. in London. Died in Rome, Nov. 30, 1694. *Prose*, Malpighian.



M. Malpighi,
Italian anatomist

Malplaquet, BATTLE OF. Allied victory over the French in the War of the Spanish Succession, Sept. 11, 1709. Malplaquet is a French village in the dept. of Nord, 10 m. S. of Mons. The duke of Marlborough and Prince Eugene, in command of the allied British and imperial troops, had been bivouacked opposite the French army of Marshal Villars for two days, Marlborough impatiently awaiting the concurrence of the Dutch envoys to make an attack. On either side over 90,000 men were engaged.

At 9 a.m. the Prussians and Austrians attacked, but were resisted stubbornly. Not till Marlborough had hurled three British battalions into the fray were the French forced back. The Royal Irish regiment then charged and totally routed the Irish brigade in the service of France, and the battle spread. The prince of Orange, on the left, was repulsed with overwhelming losses by the French; Eugene and Marlborough at the head of their troops made an irresistible assault on the centre and right, and eventually the Allies began a general advance before which the whole French force retired. Marlborough's own losses were too heavy for him to follow. In the whole war no battle

approached Malplaquet for its fierce fighting and desperate resistance, the Allies losing 20,000 men and the French 12,000. The principal result was that it gave Mons to the Allies.

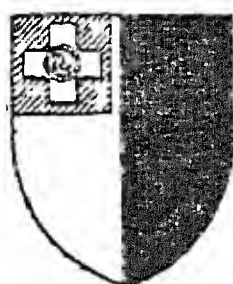
Malraux, André (b. 1901). French writer and politician. Born Nov. 3, 1901, and educated in Paris, he travelled widely and conducted an archaeological expedition in Indo-China, 1923-25. He served with the government army during the Spanish Civil War, of which he gave his impressions in *L'Espoir* (Eng. trans. *Days of Hope*). One of the leading French novelists of his day, he wrote among other works *Tentation de l'Occident*, *Les Conquérants*, *La Voie Royale*, *La Condition Humaine* (Eng. trans. *Man's Fate*), *Les Noyers d'Altenburg*. During the Second Great War he fought with the tank division, 1939-40, was imprisoned by the Germans, but escaped to what was then unoccupied France. Here he fought with the maquis, and led the Alsace-Lorraine brigade with the French 1st army in the Vosges, 1944-45. He was minister of information in the de Gaulle government, 1945-46.

Malstatt-Burbach. Industrial suburb lying to the N.W. of Saarbrücken (*q.v.*), on the right bank of the Saar.

Malt. Raw material of the brewer and distiller. It is produced by causing the seed-grains of various cereals, principally barley, to germinate, so converting their albumen into diastase, and their starch into sugar. When the growth has been stopped, the malt

is screened to remove the rootlets or "sprits," which contain about 43 p.c. of digestible carbohydrates and albuminoids. Under the name of malt-culms or malt-coombs these are given as a nourishing food to milk-cows and other cattle.

Malta. Largest of a group of islands in the Mediterranean which form a British territory. It was



Malta arms

awarded the George Cross, 1942, for its service to the British Commonwealth in the Second Great War. It lies 60 m. S. of Sicily and 180 m. from the nearest point of Africa. An important sea-air base it possesses three aerodromes, an up-to-date dockyard, and a fine double harbour on the E., at Valletta. In the First Great War it was an Allied base, in particular of the French fleet; over 100,000 British wounded from Salonica and the Dardanelles passed through its hospitals, and it became known as the nurse of the Mediterranean.

For the story of Malta during the Second Great War, see the separate entry following this.

An irregular oval in shape, Malta is 17 m. long by about 9 m. broad, and has an area of 94.9 sq. m. Off the N.W. lies the smaller island of Gozo, with an area of 25.9 sq. m. Comino and some islets are attached to Malta. The population of the islands was estimated in 1955 as 314,000.

Both Malta and Gozo, composed mainly of limestone, have an irregular and rocky surface. Some 45,000 acres of land are

under cultivation; the soil, though shallow, is rich in phosphates which render it fertile. Chief products are potatoes, onions, oranges, grapes and figs, wheat and barley. Goats, pigs, and sheep are reared. Malta can produce each year enough food for its population for 100 days only. The coastline, except on the S.W., is much indented, the chief bays being, on the N.E., Melleha, St. Paul's, and the double indentation formed by the promontory on which Valletta, the capital, is built; on the S.E., Marsa Scirocco. The climate is mild and healthy in winter, warm in summer.

The principal occupations of the inhabitants are agriculture and services rendered in H.M. dockyard and for the navy, the army, and the R.A.F. The British govt., as the largest employer of labour, keeps Maltese economy functioning. Minor manufactures include beer, lace, cotton, cigarettes, pipes, filigree. Soft limestone, cut with axes and used to build Malta's houses, is the island's only mineral.

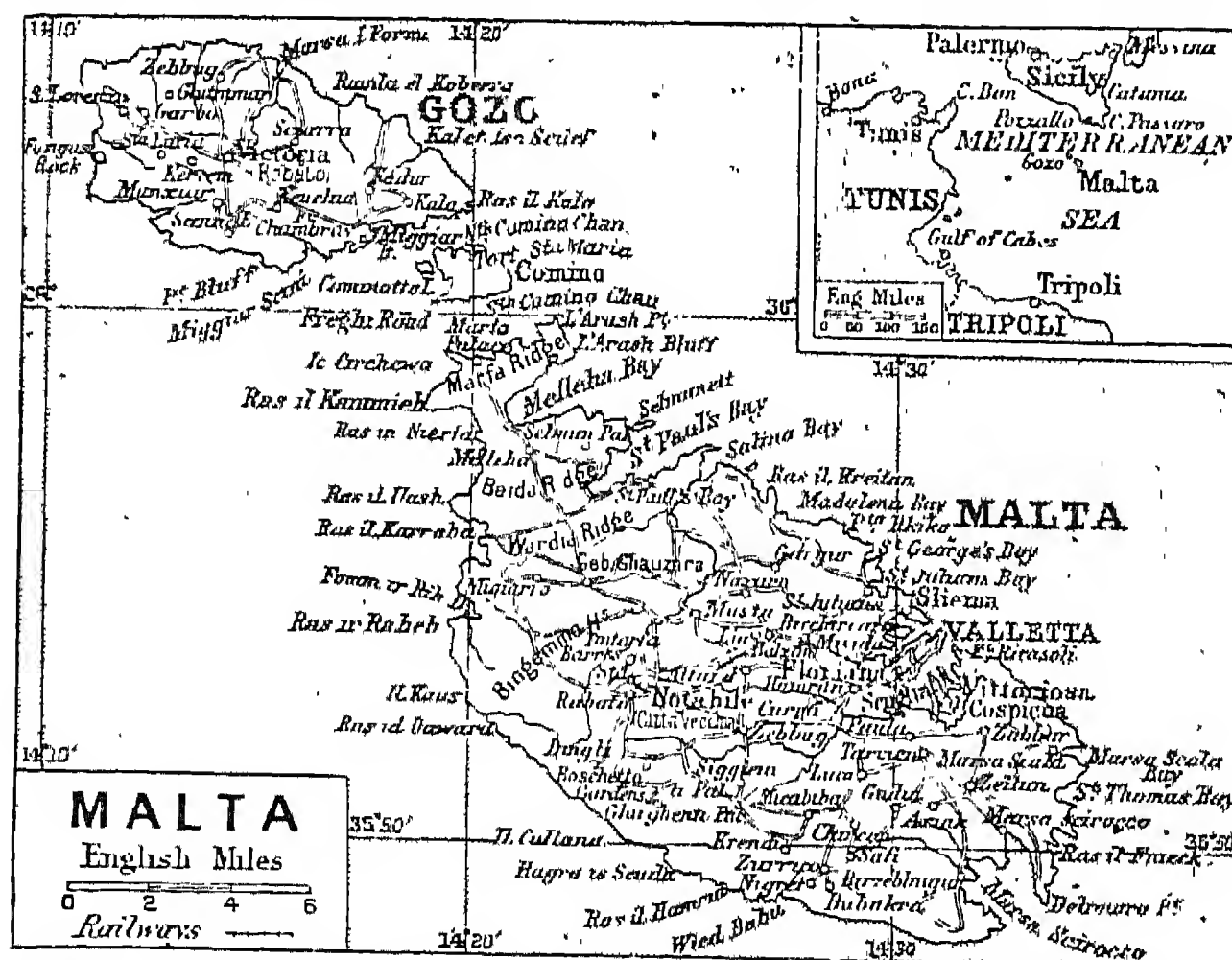
Rainfall averages 18 ins. a year. Water is stored in underground galleries, into which the rain percolates. The supply is inadequate for all needs.

The Maltese language, Berber-Semitic in origin but having Phoenician words, assimilated Arabic idiom, and has continually absorbed many European, including English words.

Early History of the Island

Malta contains some remarkable megalithic sanctuaries (*e.g.* Hal Tarxien) of the Neolithic period (3rd millennium B.C.), with oriental affinities. These shrines fell into disuse when newcomers, perhaps from S. Italy, entered Malta in the 2nd millennium. Later arrivals were in turn Phoenicians, c. 1000 B.C., and Greeks, 8th century. Carthage conquered the island in 480 B.C. The Romans turned the Carthaginians out during the Second Punic War and the island prospered under Roman rule. St. Paul's Bay is the traditional site of the shipwreck of the apostle in A.D. 58 (Acts 27).

Malta was ravaged by the Vandals and Goths in the 5th century A.D. They were driven out by Belisarius, who attached it to the Byzantine empire. North African Arabs established themselves here in 870. In 1090 the Arabs were expelled by Roger the Norman, Count of Sicily, with a handful of men, the island thus becoming a dependency of Sicily,



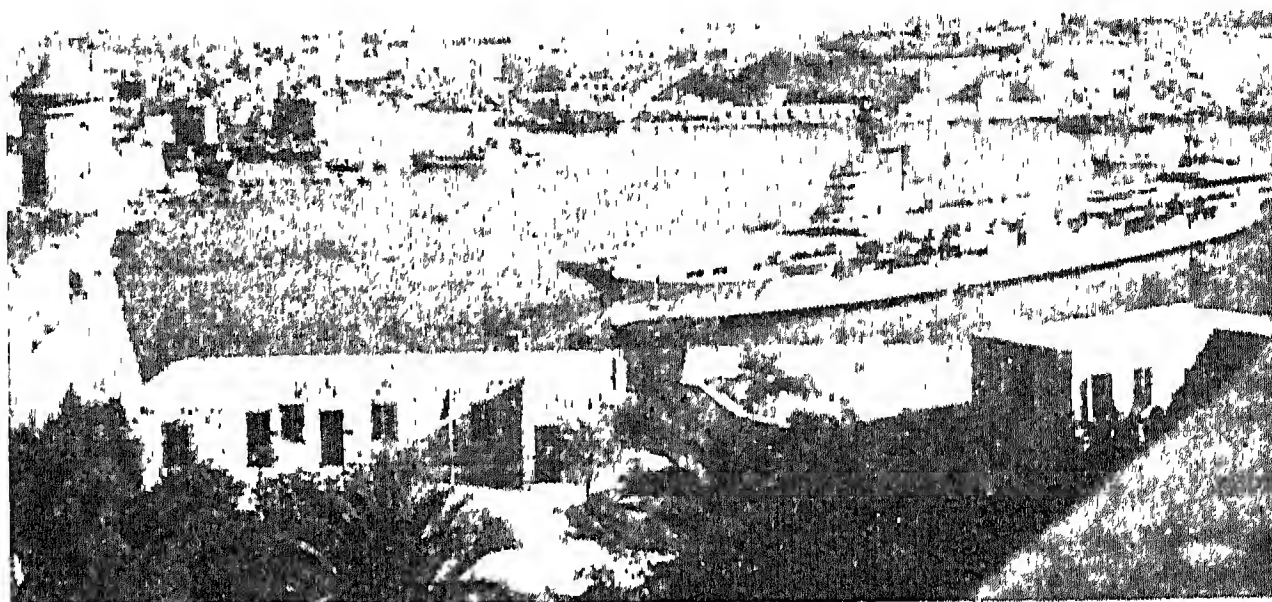
Malta. Map of the islands forming a British territory in the Mediterranean. Inset, map showing position of the islands in relation to Sicily and Africa

and like Sicily passing by marriage to the house of Hohenstaufen. On the extinction of that house, soon after 1250, Peter king of Aragon secured Malta. The Aragonese kings recognized the privileges of local govt. granted to the island by Count Roger the Norman, and set up a popular council. As a Spanish dependency Malta became part of the inheritance of Charles V and in 1530 that sovereign gave it to the knights of S. John of Jerusalem, who, driven from Rhodes by the Turks, sought a new home. When the Turks laid siege to Malta in May, 1565, it was strenuously defended by the knights, led by their grand master John Parisot de la Valette and assisted by Maltese troops, of whom 6,000 perished. The Turks withdrew on Sept. 8, 1565. On that day in 1943 the surrender signed by Italy on Sept. 3 came into

routes. Malta is also the base of the British Mediterranean fleet.

Under British protection, Malta was governed as a crown colony under the Colonial office with various forms of representative council to assist the governor, that of 1887 being the most liberal. It was replaced in 1900 by a more

to the exclusion of Maltese. From 1934 Maltese became the language of the law courts, and was taught in the university (which has an average of 250 students). Subsequent constitutions under crown colony rule, to which the island had reverted, made English and Maltese the official languages. The



Malta. Fort San Salvatore, a point in the Cottonera Lines (1668), part of the great system of fortifications constructed by the Knights of Malta. Top, Grand Harbour at Valletta, from Kalkara

effect, and the dual victory is now celebrated in Malta on that day, the feast of Our Lady of Victories, which is Malta's national day.

The knights of S. John fortified Malta and built many auberges, palaces, and churches, but in 1798 the effete grand master Hompesch, yielding to the defection of the French knights, surrendered the island to Napoleon without a fight. Three months later the Maltese rose against the French, who in 1800 capitulated to British, Maltese, and Neapolitan forces. In 1814 the treaty of Paris ratified the cession of the Maltese Is. to Great Britain, a cession made at the explicit request of the Maltese people. With the opening of the Suez canal in 1869 Malta became an important coaling station on the great trade route between Great Britain, India, Australia, New Zealand, and the Far East. With the development of air transport, she became a staging post on the empire air

restricted one. At the end of the First Great War, Malta suffered from unrest and mild riots, and in 1921 was granted responsible government under the Amery-Milner constitution, together with a grant in aid of a quarter of a million sterling. There was an elected legislative assembly of 32 members and a senate of 17. Local affairs were the concern of the prime minister and his cabinet, imperial interests and defence being reserved to the crown. Under self-government, education and communications improved and the Maltese language finally supplanted the Italian, which had been imported by Sicilian notaries at the time of the knights. Fascist interference in Malta's domestic affairs in a struggle to Italianise Malta on the part of Mussolini was strongly resisted by the Maltese people and ended in 1933 in the withdrawal of the constitution of 1921, under which Italian and English were the official languages

MacDonald constitution of 1939 created an advisory council of government, consisting of ten elected, two nominated, and eight official members, of which the governor was president; and the governor's executive council included two elected members. This form of govt. functioned throughout the Second Great War. A new constitution, restoring autonomy in local matters, promised in July, 1943, came into effect Sept. 22, 1947. The first parliament under this was opened by the duke of Gloucester, Nov. 10; Labour held 24 out of 40 seats, four parties, including a nationalist pro-Italian party with seven members, sharing the others. The assembly met in the 17th cent. hall of S. Michael and S. George, still standing though damaged by blast from enemy bombs.

The British govt. made a free grant of £10,000,000 to Malta in 1942 to help in the reconstruction of bomb-damaged buildings, and provided food subsidies of £2,000,000 a year during the last stages of the war to keep down the cost of living. Damage to school buildings and increase in pop. halted the effort made to stamp out illiteracy; 55 p.c. of the people are unable to read or write.

Bibliography. Malta and the Mediterranean Race, R. N. Bradley, 1912; Malta, its Charm and Worth, J. A. Koble, 1918; Malta of the Knights, E. M. Schomerhorn, 1922; Malta, the Islands and their History, T. Zammit, 2nd ed. 1929; Malta, Sir Harry Luke, 1949; Financial and Economic Structure of the Maltese Islands, Sir George Schuster, 1950.

MALTA IN THE SECOND GREAT WAR

The Hon. M. E. Strickland, Editor, The Times of Malta

The stubborn and heroic defence put up during 1940-43 by Malta, isolated British island in a hostile Mediterranean, is here vividly described by one who shared in it

In 1939 there were two schools of thought regarding the strategic value of Malta in the event of a declaration of war by the Axis on Great Britain and France; one, that Malta would be torn from the empire, the other that Malta could and would be defended. The chief protagonist of the second was Lord Strickland, prime minister of Malta and leader of the elected majority in the council of govt.

After the Munich crisis it was decided to strengthen Malta's defences. A.A. guns were dispatched from Great Britain, and the cutting of deep rock shelters in the dockyard area began in 1939. Malta came under the French zone of Mediterranean responsibility, and the air defence was to be supplied from bases at Bizerta.

From Sept., 1939, to June 19, 1940, after the first anxiety as to whether Italy would fight or not was allayed, Malta continued on its peace-time level, save that the fleet had sailed and only submarines remained. Maltese traders imported stocks of wheat, other food, and fuel. Some surface shelters were built.

In May, 1940, Gen. Sir William Dobbie became acting-governor, an appointment confirmed when his predecessor, Gen. Sir Charles Bonham-Carter, was invalided out of the army. On June 8 the Maltese quisling Carlo Mallia broadcast from Rome that he and his friends were coming to liberate their Maltese brothers from the British yoke. A wave of anger swept the island. Anti-Italian demonstrations took place in Valletta, and in the towns and villages. Mussolini's declaration of war at 5 p.m. on the 10th relieved the tension. Malta waited, but not for long. The French air defence she should have had was not there.

The First Air Attacks

At 6.45 a.m. on June 11 came the first air attack, followed through the day by seven successive waves. The guns blazed back. Anger surmounted fear. Casualties were far fewer than had been anticipated: the solid stone houses stood up to the 500-lb. Italian bombs. Admiral Sir Wilbraham Ford organized the dockyard defence battery. Evacuees poured out from the three dockyard cities to the inland towns and villages. Air attack continued. Malta put

on a stoical mood almost overnight; it was not to yield as the months passed. Four British Gladiators took the air, plunged in among the Italian marauders, and shot some down. One Gladiator was lost. The three others, which became known as Faith, Hope, and Charity, fought on. The A.A. guns, manned by Maltese gunners and gunners from the U.K., also took their toll of the enemy. Aug. brought six Hurricanes as reinforcements from Great Britain, sent despite her own desperate need, for the battle of Britain was on, too. Everyone in Malta began cutting rock shelters in the soft limestone; by the end of 1941 eleven miles of shelters had been cut by hand.

The A.R.P., which had come into being in 1935 during the Abyssinia crisis, when Malta had the first anti-gas school in the empire, functioned well; so did the special constabulary.

Development of the Battle

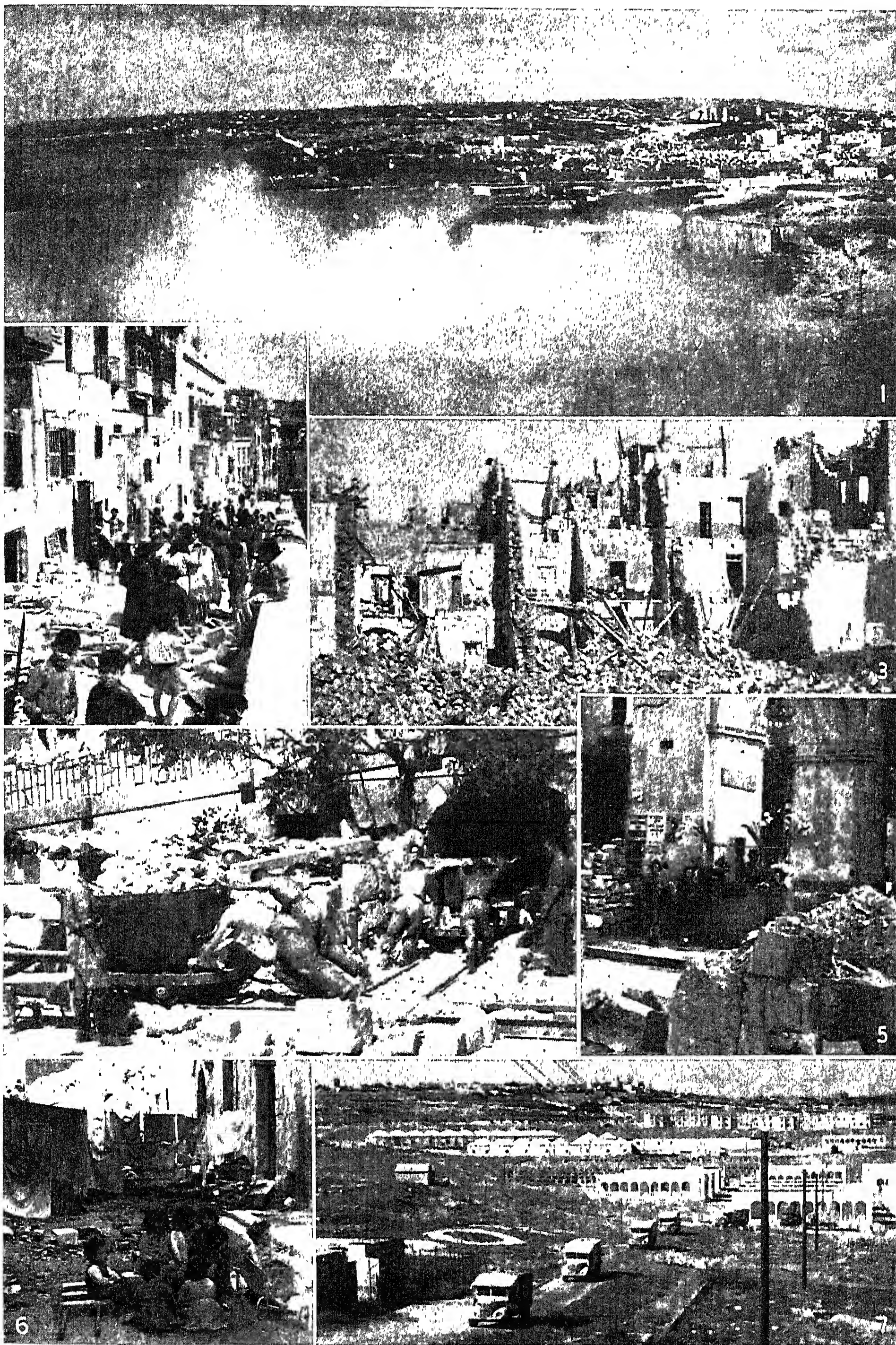
In Oct., 1940, military reinforcements for the thinly held beach posts, and additional guns, arrived. Thousands of Maltese volunteered for the King's Own Malta regt. and Royal Malta Artillery. Sir Andrew Cunningham arrived in the Warspite in Dec., after bombarding Valona, and a wave of enthusiasm swept Malta: the navy was back. Mussolini's boast that the Mediterranean was an Italian lake was disproved. In Jan., 1941, the scene changed. In limped the aircraft carrier H.M.S. *Illustrious* and the damaged destroyer *Gallant*. The dockyard worked feverishly to repair the *Illustrious*, the wounded were tended, the dead buried. Then came a new menace in the sirens' wail. Something new happened. The German Stuka dive-bombers were there, swooping in a perfect circle upon the great ship and her protecting land guns. The dust of battle cleared. The battered ship had survived. She survived further attacks and sailed to fight again. But from then on Malta was to know the meaning of war. The 1,500-lb. armour-piercing bombs cut through her stone buildings, the savage air attacks wore on, a slow process of attrition. In May, 1941, the Italians relieved the Germans. Malta was reinforced. Air Vice-Marshal Sir Hugh Lloyd

took command of the R.A.F. Malta-based planes began bombing Naples. At dawn, July 26, 1941, the Italians launched an E-boat attack on the Grand Harbour. Gunners of the R.M.A. shot up the whole of the attacking force of 17. Aircraft finished the job.

The Royal Navy's surface ships were again in and out of Malta and Malta-based submarines were winning laurels. In Dec., 1941, the Germans returned and began a day and night aerial attack which lasted with little respite until May, 1942. On April 15, 1942, King George VI awarded Malta the George Cross. On May 10, 1942, a great victory was won. The air defence had been down to seven planes, but Spitfires were flown in from aircraft carriers and went straight into battle; they and the guns of Malta shot down 63 enemy planes and damaged 31. Before this, the March convoy which the navy had brought in lay wrecked and burning in the harbours. Every village bore its bomb scars.

Severe Food Shortage

On May 7, 1942, F.M. Viscount Gort relieved Gen. Sir William Dobbie. Devastation reigned in Malta, but it was to be even greater yet, and food was getting short. The British 8th army was thrown back to Mersa Matruh—Malta was still a thousand miles from any friendly land. The last phase of the aerial siege began in earnest. Bread was rationed at 10½ oz. a day, with 1 oz. of corned beef or goats' meat. There was no flour, butter, or coffee, and only 1 oz. of tea a week. One plate of soup was allowed at communal meals, or 1 oz. of corned beef if not drawn at home. There was no milk except for children under three. Gort organized a rigid economy. Livestock was ruthlessly reduced and transport limited. The food resources of Malta and the adjacent islands were pooled for army and civilians as one. The army got 1,750 calories a day, civilians 1,350. By June there was no milk save for babies and nursing mothers and the sick. All restaurants closed on July 14. By Aug. one meal a day was being served to all alike by communal kitchens in every town and village. In June two ships made for Malta from the W. and Malta's scanty harvest from her bomb-cratered fields was coming in. A convoy coming from the E. turned back—its fuel and ammunition had been exhausted before it could reach its goal. Aug. saw the epic convoy reach the island—



1. Bomb smoke over the bastions of Valletta. 2. Homeless inhabitants of Valletta on their terrace after a raid. 3. Typical air raid damage. 4. British coal miners working with Royal Engineers on the excavation of

shelter tunnels; a loaded skip is being pushed away, and an empty one goes for refilling. 5. Flower stall amid the devastation. 6. Children playing amongst the ruins. 7. Casualties from Italy enter a reception area

MALTA: ILLUSTRATING HER INDOMITABLE SPIRIT IN THE SECOND GREAT WAR

Photos, British Official, Crown Copyright reserved

four-and-a-half ships out of 14 that sailed; they saved the island from defeat. There were two ration periods left when, on Nov. 19, 1942, thanks to the victory of Alamein and the subsequent fall of Tripoli, "bomb alley" was opened in the E. and four ships made Malta unmolested. The siege was raised, for these ships were the first of a stream of 58 which arrived within two months. The first substantial increase in rations was on Jan. 21, 1943. Customers at communal kitchens decreased from 205,000 to 20,000 in Nov., 1942.

Throughout this period Malta-based aircraft and submarines continued to attack Axis transport carrying supplies for the Afrika Korps; their success deprived Rommel of much needed oil and petrol, men and munitions. The maintenance of Malta's own diminishing supplies of vital essentials was assisted by consignments from submarines and bombers.

Renewal of Air Attack

On Oct. 4, 1942, the 3,000th alert heralded a renewal of the air attack. By the 18th, 119 enemy aircraft had been destroyed by the R.A.F. for the loss of 27 Spitfires, 14 pilots being saved; 14,000 sorties were flown by the enemy, but Air Marshal Sir Keith Park used the tactics of offence by which the battle of Britain had been won. He had only a few days' petrol left when the enemy called off the attack, and Malta's guns would again have been without assistance and short of ammunition. With relief the garrison and people of Malta tightened their belts to continue the fast which bombing was rendering intolerable. Firewood from the damaged houses kept the victory kitchens in fuel. Nine-tenths of the population were dependent on the communal daily meal provided by them.

On Oct. 23 the Eighth Army opened its offensive at Alamein. On Nov. 8, U.S. and British forces landed in Morocco and Algeria. Nov. 19 saw the death sentence on Carmel Borg Pisani for treason; he had landed in Malta from Italy in Aug., was arrested and tried by a Maltese civil court.

Among some 120 Maltese arrested when Italy entered the war were Dr. E. Mizzi, leader of the Nationalist party and the former chief justice Sir A. Mercieca. They were later, with the consent of the council of government, deported to Uganda for the rest of the war.

On Dec. 11, Malta's aircraft joined in the Tunisian battle, making an onslaught on enemy air

transports. On March 24, 1943, Malta saw its first balloon barrage and began to prepare for the invasion of Sicily. On June 20, 1943, the king arrived at his George Cross island on board H.M.S. Aurora; he received a tumultuous welcome.

In July Malta was crowded with men and supplies. Eisenhower, Cunningham, Montgomery, and Alexander had their H.Q. in Malta, deep in her rock shelters, before invading Sicily. Malta's armada joined the thousand other ships that sailed to reach Sicily on July 10, 1943. Malta's aerodromes provided the base for the R.A.F. fighter cover for this first invasion of Axis Europe. Malta had vindicated her stand, the armed forces had their reward for the sacrifices made in her defence. Malta's story is well summed up in Gen. Eisenhower's statement to Lord Gort published in *The Times of Malta*, Aug. 5, 1943: "The epic of Malta is symbolic of the experience of the United Nations in this war. Malta has passed successively through the stages of woeful unpreparedness, tenacious endurance, intensive preparation, and the initiation of a fierce offensive. It is resolutely determined to maintain a rising crescendo of attack until the whole task is complete. For this inspiring example the United Nations will be forever indebted to F.M. Lord Gort, the fighting services under his command, and to every citizen of the heroic island."

The *Times of Malta*, the Sunday *Times of Malta*, and *Il-Berqa* maintained unbroken publication throughout the aerial battle and the long siege.

The Price of Victory

Casualty figures were: civilians, June 11, 1940, to Dec., 1943: killed 1,190 (including 404 children), died of wounds 296, missing 54, seriously injured 1,846, slightly injured 1,932. The fatality rate represented 5.7 per thousand pop.

10,400 houses were demolished, 18,000 partly damaged, 48 churches damaged or destroyed; the church of S. Mary of Damascus, 1576, was obliterated, and the oldest part of the palace of the grand master of the Order of S. John, begun 1574, was destroyed.

In 1942 the death rate exceeded the birth rate (by 1,835) for the first time since 1799. In the spring of 1943 an epidemic of infantile paralysis swept the island. Malta, apart from Gozo, had 375 cases. In Aug., 1943, a typhoid epidemic broke out, the result of dislocation of drainage by bombing. Of some 1,000 cases, 100 were fatal.

Military casualties: army, Maltese and U.K., under 300; naval, under 200; R.A.F., about 80. Casualties in the navy and merchant navy ships that fought through to Malta were over 2,000.

Axis planes destroyed from June, 1940, to July, 1943: 1,237; 236 were shot down by gunners, 1,001 by the R.A.F. Alerts, 3,343; 16,500 tons of bombs were dropped on Malta.

There were approx. 15,000 Maltese in the army and an equal number of troops from the United Kingdom forming the garrison. Conscription was agreed to in 1941. Over 4,000 Maltese served in the Royal Navy and merchant navy, and over 1,000 in the R.A.F.

After the raising of the siege, from Dec., 1942, to April, 1943, planes based on Malta destroyed 216 rly. engines, eight in Tunis, the remainder in Italy and Sicily. Submarines based on Malta sank 1½ million tons of Axis shipping during the war, and three V.C.s were won by men of Malta-based submarines.

Malta, KNIGHTS OF. Name sometimes given to the knights of the order of S. John of Jerusalem, during the period 1530-1798, when they ruled Malta. Once established in the island, they continued their martial career. They helped Charles V in his campaign in N. Africa, but soon their whole energies were occupied in defending the island from a great Turkish attack. The knights took their galleys, in 1571, to fight at Lepanto.

In the 17th century the knights were constantly at war, but the order soon began to lose ground. They helped to defend Candia against the Turks and fought under John Sobieski in Hungary. They warred, too, against Venice. In the 18th century one or two of the grand masters made spasmodic attempts to restore the power of the order. The knights lost Malta in 1798, when the grand master, Ferdinand von Hompesch, surrendered it almost without a struggle to France. Many of the buildings erected by them were damaged or destroyed by enemy bombing from the air during the Second Great War. Part of the palace of the grand masters at Valletta survived, but the oldest portion, dating from 1574, was destroyed, and the marble staircase was damaged. See *Knighthood; Malta; consult also The House of the Temple*, F. W. Ryan, 1930.

Malta Artillery, ROYAL. Regiment of the British army. Formed in 1802 as the Malta Coast Artillery.

lery, it assumed its present title in 1889. All ranks are Maltese, and during the Second Great War the regiment earned distinction for its work in the A.A. artillery defence of the island. In 1940 King George VI became col.-in-chief of the unit.

Malta Fever. This term is a misnomer for Undulant Fever (*q.v.*).

Maltese Cross. Badge of the order of the knights of Malta. This is a development of the cross pattée or formée, the limbs expanding in thickness towards the ends. In the Maltese Cross each extremity is indented, so that it is sometimes known as the cross of eight points. See Cross.

Maltese. The name of a very ancient European breed of toy dog. It is sweet tempered, affectionate, and intelligent. The head is of terrier type, but not too narrow, with a black nose and long well-feathered ears. The legs are short and straight, the body cobby and low to ground. The tail is well arched over the back and copiously feathered. The coat is long, straight, and silky, never woolly. Any self colour is allowed, but pure white is preferred. Slight lemon markings are permissible. The approved weight is four to nine lb., and not over 10 lb.

Malthus, THOMAS ROBERT (1766-1834). British economist. Born near Dorking, Surrey, Feb.



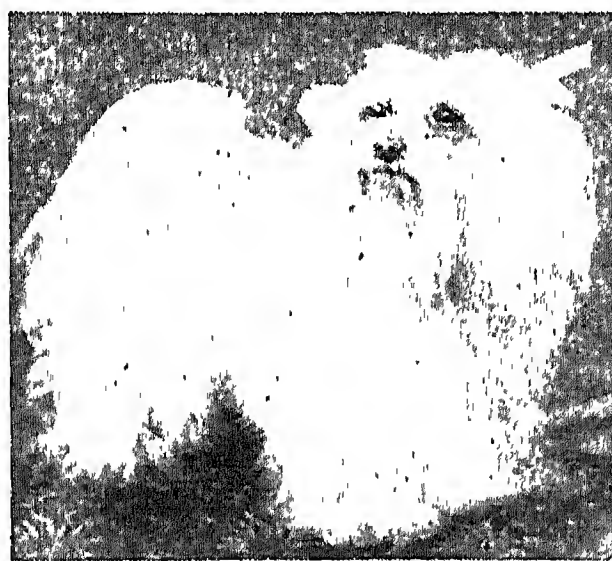
Thos Malthus

17, 1766, and educated by private tutors, he went to Jesus College, Cambridge, where he became a fellow. He was ordained and held a curacy for a time, but soon gave his attention to political economy, which was to be his life study. The work by which he is best remembered, his *Essay on Population*, was first published in 1798 by way of reply to Godwin's *Enquirer*, 1797, and met with fierce criticism. His theory (*v.i.*), suggested, perhaps, by Hume's *Essay on the Populousness of Ancient Nations*, was attacked afterwards by Karl Marx in his *Capital*, and by other writers.

In 1799 Malthus made a tour through Scandinavia and Russia in search of information, and in 1802 visited France and Switzerland. The new edition of his *Essay*, 1803, was virtually rewritten, and in it he acknowledged the effects of prudence as a check

on population, which in the first edition had only been implied. In 1805 he was appointed professor of political economy at the East India College, Haileybury, and here he passed his remaining years except for short intervals of travel. He was elected F.R.S. in 1819. He wrote *Political Economy*, 1820, and other works, and died Dec. 23, 1834. See *Malthus and His Work*, J. Bonar, 1885.

Malthusianism. Theory of population expounded by T. R. Malthus (*v.s.*). It became almost identified — wrongly — with the views and principles of those who advocate small populations and birth control. Malthus, in his



Maltese. Champion specimen of this breed of toy dog

Essay on the Principles of Population as it Affects the Future Improvement of Society, 1798, challenged Rousseau's theory of the "perfectibility of society" by pointing out that the natural tendency of population was to increase faster than the means of subsistence. Directly or indirectly, therefore, the size of a population was, he held, controlled by want and its attendant miseries.

In essence, this view has never been seriously controverted; and it is certainly not incompatible with the great rise of populations which kept pace with growing industrialisation and increase in scientific knowledge during the 19th century. Malthus's law, however, is not the only one governing changes in size of population; such changes are influenced by many considerations.

The views of Malthus, though by no means original, were a shock to the orthodox opinion of his day; and he was also much misunderstood. Later he was acclaimed as an inspired prophet by the advocates of contraception. Malthus himself, however, advocated only "moral restraint"; and there is good reason to think that he would have been shocked at the practice of contraception by mechanical means.

Malthus's great contribution to scientific thought was indirect. It was his *Essay on Population* which inspired both Darwin and Wallace to produce the theory of evolution: if population presses upon subsistence, they argued, then the individuals which survive to breed will be the fittest — hence the origin of species and natural selection.

Malting. Term for the conversion of cereal grains or other seeds into a dry, friable condition, the product being known as malt. Long experience has proved to the brewer that barley best serves his purpose, and much care is given to the growth and harvesting of malting barley in California, India, Great Britain, and elsewhere.

The barleycorn includes a small germ at the lower end which would, in normal conditions, develop into a new plant; behind and above this is the main bulk of the corn composed of a hard network of cellulose enclosing many millions of starch grains, known as the endosperm, and surrounded by a thin layer of cells containing grains of protein, the whole seed being enclosed in a chaffy covering or husk.

As harvested, barley requires a certain resting period before germination can begin, and a longer period before it is fully matured. Maturity can be accelerated by a process known as sweating, in which the barley is heated on a kiln to 100° or 110° F., with occasional turning, for about 30 hrs. This treatment eliminates excess of moisture, and full maturity is attained a few weeks later. Since the moisture content at this stage is about 12 p.c. the barley can be stored without deterioration for a long time.

The maltster screens barley to remove such foreign matter as other seeds, stones, and dust. The barley is then steeped in water to remove some of the remaining extraneous matter by flotation. Two or three changes of water are used in steeping which lasts for 50-100 hrs.; the grain absorbs a considerable weight of water, and the excess is run off.

The wet barley is spread out upon the malting floor in a layer a few ins. thick, known as the couch. This begins to germinate, each corn producing a few rootlets, the shoot, or acrospire, growing up beneath the husk. The respiration of the growing seed produces heat, and to keep the temp. down the mass is turned at intervals either by hand or by a

mechanical plough. During this process various enzymes are formed; one, the cytase, acts upon the hard interior network or cellulose, breaking it down and rendering the enclosed starch accessible in the mashing procedure. At the same time some of the insoluble protein is attacked by proteolytic enzyme and converted into simpler soluble compounds.

When the shoots are about three-quarters the length of the corn (in 9–12 days), the thickness of the couch is increased, and it is then left to wither for a day or more, when the rootlets begin to shrink and develop a little colour. The product now contains about 40 p.c. of water and is known as "green malt." The green malt is spread in a thin layer upon the perforated floor of a kiln, and a current of warm air heated by a fire beneath is passed through it for one or two days during which it is frequently forked and turned until the mass becomes what the maltster calls hand-dry.

The next process, curing, involves reducing the supply of air and allowing the temp. to rise gradually to about 200° F., when the moisture is still further reduced, the enzyme diastase is partly destroyed, and the malt develops colour and a pleasant biscuity flavour. For pale ales, the colour of the malt is increased only slightly, for mild ales or stouts it must be darker. When unloaded from the kiln the malt contains about one p.c. of moisture and is allowed to cool before being removed to storage.

This traditional flooring method of preparing malt is still used; but various forms of plant have been designed. In some the

germination takes place in large boxes (Saladin method), in others in revolving metal drums (Kropff, etc.), in which temp., aeration, humidity, etc., are easily controlled. The malt produced in these plants is no better than that grown by the older method; but less floor space is required, malting can be carried out at any time of year, and with less manual labour.

By the use of higher curing temps. amber and brown malts are obtained, the latter usually by roasting over an oak-wood fire. Crystal malt is prepared by heating green malt to 160° F. when the interior of the corns liquefies, after which the temp. is raised until the desired colour is produced. On cooling, the liquid interior solidifies to a brown crystal-like mass of characteristic flavour. The darkest variety, black malt, is made by roasting ordinary kilned malt in a revolving drum over a series of gas flames, after which it is rapidly cooled with a water spray to prevent spontaneous combustion.

Malt usually contains more diastase than is necessary to convert the whole of its starch into sugar in the mash tun. It is therefore sometimes desirable to add unmalted starch-containing materials to the grist, especially if the malts used have a high nitrogen content. The principal materials in the U.K. in normal times are thin flakes of maize and rice, produced by removing the husks, germ, etc., and heating the remainder with water to form a paste. Other materials—potatoes, rye, raw barley, etc.—have been tried, but without much success. See Brewing.

Malton. A market town and urban dist. of (Yorkshire (N.R.). It stands on the Derwent, 18 m. to N.E. of York, and is served by rly. It consists of Old and New Malton, while across the Derwent is the sister town of Norton, which is in the East Riding. The chief buildings include three churches, S. Michael's, S. Leonard's, and S. Mary's, all containing Norman work. S. Mary's was the church of a Gilbertine priory. The chief industries are brewing, and milling, and the making of agricultural implements. Malton is also a centre for horse-breeding. Near is Castle Howard. In early Saxon times

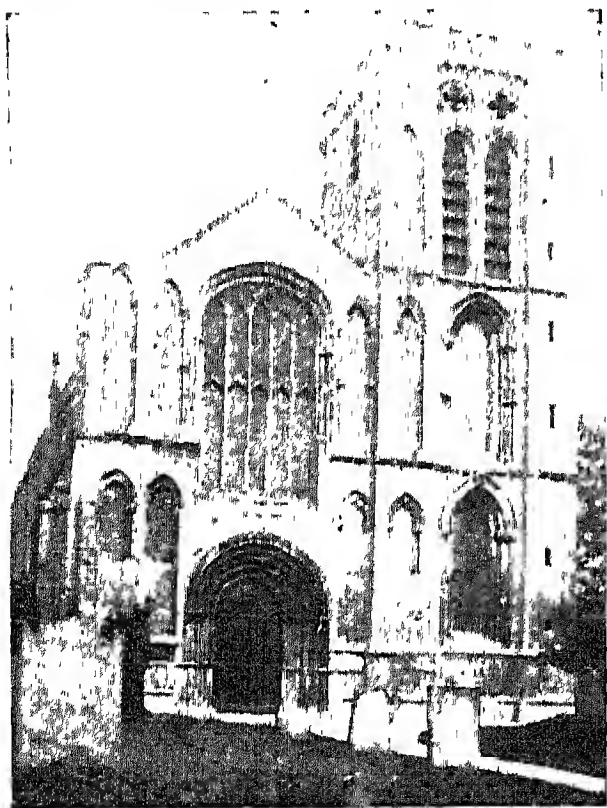
Malton was the residence of the kings of Northumbria; it became a town soon after 1066 and a castle was built. From 1640 to 1885 it was represented in parliament. Its rights as a bor. were lost in 1684. In 1894 it became an urb. dist. Roman remains have been found. Market day, Sat. Pop. (1951) 4,235.

Maltose. Sugar prepared by the action of malt upon starch. It was at first mistaken for dextrose, but its true nature was pointed out by A. P. Dubrunfaut, who gave it the name maltose. To prepare it starch is mixed with water, and heated on a water-bath until it gelatinises. To this is added the crushed malt, and the mixture kept warm for an hour to enable the enzyme of the malt (diastase) to hydrolyse the starch into maltose and dextrin. These two substances are separated by means of alcohol, which dissolves the maltose, leaving the dextrin as a residue. Maltose crystallises in fine needles, and when boiled with dilute sulphuric acid is decomposed into grape sugar.

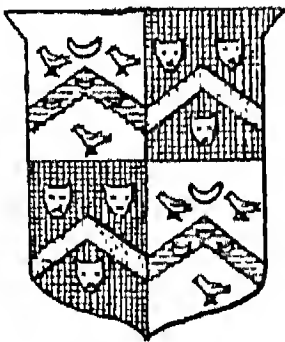
Malvaceae. Family of herbs, shrubs, and trees. Natives of all temperate and tropical regions, they have alternate leaves, and the sepals are united to form a five-lobed calyx. There are five petals, and numerous stamens and styles. The calyx has often an outer false calyx (*epicalyx*) formed of united bracts. Many of the species yield fibres, for example cotton (*Gossypium*), and all are mucilaginous. Genera found in the British Isles include *Althaea* (marsh mallow, hollyhock), *Malva* (mallow), and *Abutilon*. *Hibiscus* is another member of the family.

Málván. Town and port of Bombay state, India, in the Ratnágiri dist. It is the chief harbour on Málván Bay, which affords a safe anchorage for coasting vessels, and is 70 m. S. of Ratnágiri. It was formerly a stronghold of Mahratta pirates, who were extirpated in 1812. In that year Málván was ceded to the British government by the raja of Kolhapur. Pop. (1951) 29,851.

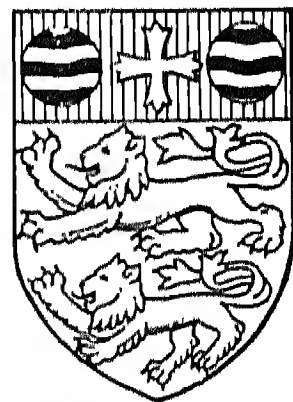
Malvern. The name used for Great Malvern, an inland resort and spa, urban district, and educational centre of Worcestershire, England, and also for a number of other places on the Malvern Hills, all visited for health and pleasure. These include



Malton, Yorkshire. West front of S. Mary's, or the Priory Church of Old Malton
Valentine



Malton arms



Malvern arms

Little Malvern, Malvern Link, Malvern Wells, West Malvern, and North Malvern. Great Malvern is 7 m. S.W. of Worcester. Its chief building is the beautiful cruciform church which once belonged to a priory founded in the 11th century; there are remains of the refectory. Mainly Perpendicular, it has a Norman nave, and is noted for its glass. Of the springs the chief is St. Ann's Well.

Malvern votes in the co. constituency of S. Wores. Pop. (1951) 21,505.

A dramatic festival founded by Sir Barry Jackson and Roy Limbert (1893-1954), was held at Malvern each summer during 1929-39. Sixty-five plays by some 40 dramatists were given in the 11 seasons, six specially written by Bernard Shaw: *The Apple Cart*, *Too True to be Good*, *The Simpleton of the Unexpected Isles*, *On the Rocks*, *The Millionairess*, and

(b. 1883). British doctor, administrator, and politician. Born July 6, 1883, he was educated at Malvern College and St. Thomas's Hospital, London, and held appointments at St. Thomas's and the Great Ormond Street Hospital for Sick Children before going to Southern Rhodesia, where he was a medical practitioner 1911-1921, and afterwards a consultant; he served with the R.A.M.C.

1914-17. A member of the legislative assembly of Southern Rhodesia during 1923-53, prime minister of that colony 1933-53 he did much to promote the setting up of the federation of Rhodesia and Nyasaland, of which he was prime minister from its creation in 1953 until he retired from public life in 1956. His 23 years as a prime minister were the longest unbroken period served in that office by any minister of the Commonwealth.

He was made K.C.M.G. in 1941, C.H. 1944, and created Viscount Malvern 1955.

Malvern Hills.

Range of hills in England. It extends for about 9 m., mainly N. and S., partly in Worcestershire and partly in Herefordshire. The highest points are Worcestershire Beacon (from

which 15 counties can be seen) and Herefordshire Beacon, both nearly 1,400 ft. high. Other heights include North Hill, Hollybush Hill, Sugarloaf Hill, Swinyard Hill, Midsummer Hill, and Gloucester Beacon. The district is called Malvern Chase. The Malvern Hills Act, 1924, was designed to preserve various beauty spots here. On Herefordshire Beacon are remains of a British camp.

Malvernian. In geology, a group of Pre-Cambrian rocks which form the main ridge of the Malvern Hills (*v.s.*). Probably the rocks were originally sediments, tuffs, and volcanics of fairly basic composition. Later they were rendered gneissic by metamorphism accompanied by permeation by granitic fluids. The resulting rocks

are now of variable character, which can be graded from basic amphibolites to acid granites.

Malvery, OLIVE CHRISTIAN (d. 1914). British author and social worker, known also under her married name of Mrs. Archibald Mackirdy. Her first book, *The Soul Market*, 1906, was followed in 1907 by *Baby Toilers*, an investigation into the conditions of children in industrial life. Later works included *A Year and a Day*, a record of investigations into the employment of women, 1912; and, in collaboration with W. N. Willis, *The White Slave Market*, 1912. Her work on behalf of homeless women and girls led to the establishment of homes in London and the provinces, she herself founding two which she presented to the Church Army and Salvation Army. She died Oct. 29, 1914.

Malvolio. Character in Shakespeare's *Twelfth Night*, steward to the Countess Olivia. His prim, pompous self-righteousness makes him the butt of Sir Toby Belch and his bibulous cronies. By means of a letter purporting to come from Olivia they trick Malvolio into making a fool of himself before his mistress. It is to him that Sir Toby exclaims: "Dost thou think, because thou art virtuous, there shall be no more cakes and ale?" and in the fabricated letter to him appear the words: "Some are born great; some achieve greatness; and some have greatness thrust upon them."

Malwa. Historically, a tract of central India, lying N. of the Vindhya range and drained by the Mahi river. It was annexed to the Mogul empire by Akbar in 1562, and later fell to the Mahrattas and so to the British until 1947.

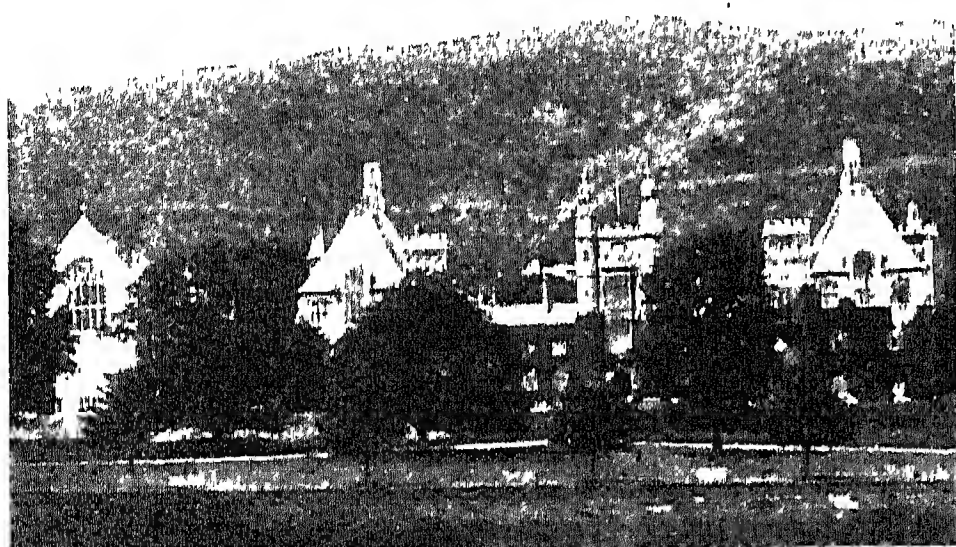
The princely states of this area of India united in 1948 to form the Malwa Union, or United States of Madhya Bharat, merged in Madhya Union (*q.v.*) in 1956.

Mamba. Slender snake inhabiting central, E., and S. Africa. It attains a length of 10 ft. and, with the possible exception of the hamadryad, is the deadliest of all snakes. There are two varieties, one black which seldom leaves the ground, the other green which often lies entwined in the branches of trees overhanging paths and may bite on the head and shoulders anyone passing under the tree. The bite is usually fatal within a few hours.

Mamelukes (Arab., slaves). Military class of foreign origin in medieval and modern Egypt, to which they gave a number of sul-



Malvern, Worcestershire. The cruciform Priory Church from the N.E.



Malvern College. School buildings, with chapel on the left, from the cricket ground

Geneva. Many 17th-century plays were revived.

MALVERN COLLEGE, a public school at Malvern, was founded in 1862, and opened in 1865 as a Church of England school with a system modelled upon that of Winchester. Its 500 boys live in ten houses, and there are a small number of day boys. It is divided into classical and modern sides, and has a school of engineering.

Malvern, SIR GODFREY MARTIN HUGGINS, VISCOUNT



Viscount Malvern, British politician

tans. In the 13th century the Seljuk Turks, whose greatest chief had been the sultan Saladin, were masters of Egypt and W. Asia. It was a Turkish custom to carry off boys from conquered territories as slaves, and to train them as military bodyguards for the sultans.

Such a bodyguard of white slaves or Mamluks was formed in Egypt. The Mamelukes became an invaluable fighting force; their leaders were taken from their own ranks, and in 1250 their commander, Kutuz, overturned the government and made himself sultan of Egypt. Ten years later another Mameluke captain, Beibars (*q.v.*), slew Kutuz and seized the sultanate. From this time the Mamelukes were masters of Egypt and ruled until the conquest by the Ottoman Turks in 1517. The series is divided into two groups, the Turkish (1250-1390) and the Circassian (1390-1517). The succession of each sultan was usually secured by the violent death of his predecessor. Lesser Mameluke chiefs ruled the provinces under a kind of feudal system.

The Mameluke sultans were, on the whole, able rulers, and raised Egypt to great prosperity. They were also great patrons of literature, architecture, and other arts. After the Ottoman conquest, Egypt was officially placed under a Turkish pasha, but virtually under Mameluke beys, who controlled the several provinces. The army overthrown in Egypt by Bonaparte, 1798, was a Mameluke force. They were exterminated or expelled by the pasha Mehemet Ali in 1811.

Mamers. Town of France, in the dept. of Sarthe, 28 m. N.N.E. of Le Mans, with which it has rly. communication. It is a junction on the Ouest line. There are cloth and leather industries, printing works, and sawmills. The church of S. Nicholas dates from the 13th-15th centuries, with Renaissance additions. Pop. (1954) 5,086.

Mamertine Prison (from Mamers, a form of the name Mars). Alternative name, of medieval origin, for the Tullianum (*q.v.*), the subterranean prison of ancient Rome on the Capitoline hill.

Mammal (Lat. *mamma*, breast). Name given to the class of vertebrate animals which suckle their young. Some time when coal was still being laid down by the overwhelming of great forests, the Amphibia (*q.v.*), the first vertebrates to conquer the land, gave rise to two separate lines of descendants which differed from amphibia and

from each other. Both of these lines, together with the amphibians, are represented by animals alive today. One line consisted of ordinary reptiles, related to, and in many ways like, living reptiles. Some of these had, there is every reason to think, four-chambered hearts derived from the amphibian three-chambered heart by complicated but explicable steps. The other line consisted of reptiles, too, but they were very different. They almost certainly had four-chambered hearts, which, however, could not possibly be derived by the same steps from the amphibian three-chambered heart. These reptiles are generally called the theromorph, or beastlike, reptiles, the implication being that they were the true ancestors of the mammals. Through the Permian, the Triassic, and the Jurassic they formed a relatively tiny group numerically. They were small animals, active, and of rapidly growing intelligence.

The Dominant Group

At the end of the Cretaceous period this group stepped into the place of the ordinary reptiles, most forms of which met disaster for some obscure reason at this time. Through the Cainozoic period, up to the present day, they have remained easily the dominant group. They have produced a number of lines of highly successful and very specialised forms, and at the same time there have remained lines of primitive, relatively unspecialised, mammals, such as the hedgehog, which probably resemble in many ways the earliest creatures which could fairly be called mammals.

Perhaps the most important single step taken by the evolving line of mammals was the acquisition of a mechanism for stabilising their internal temp. By burning their food at a slow rate, all animals inevitably produce some heat. The mammals have a metabolism so balanced as to give considerable amounts of heat even when relatively little active work is being done. Great exertion generates relatively great amounts of heat. This necessitates some cooling mechanism. Heat is lost, in these circumstances, through evaporation at surfaces, particularly through the evaporation of sweat. Large mammals, in which the ratio of volume to surface is high, are confronted with a serious problem in keeping cool, small mammals with an equally serious problem in keeping warm. Mice do not live in arctic conditions. The arctic fox is probably near the lower limit of

practicable size for such regions. At a relatively constant internal temp. of about 37° C., the mammals can develop very precise chemical mechanisms of all kinds to mediate their precise and elaborate lives. Such precision and such elaboration would be impossible in conditions of wildly varying temp.

The other vital step in the evolution of the mammals was the retention of the developing embryo within the mother's body for an increasing time. This made possible an elaboration of the brain in circumstances where the individual was safe from competition with all but its litter-mates. Subsequent maternal solicitude and provision of milk enabled the young to survive bearing a brain, scarcely functional and at that age a handicap, but destined at maturity to give its owner a decisive advantage in the struggle for existence against stronger but stupider rivals.

These two things, control of temp. and maternal nourishment of the young, have been made possible in the mammals by the development of those particular structures which distinguish the group: hair, sweat, and those modified sweat glands which provide milk.

Hair and Keratin

Hair (*q.v.*) is a special local manifestation of the capacity found all over the skins of mammals, and many other animals, to produce a horny substance called keratin (*q.v.*). Its production at the walls and the tip of a little nodule sunk in a pit at a very much higher rate than elsewhere leads to the production of a hollow, dead tube of keratin, perpetually elongating, at varying rates, by the accretion of new keratin at the base. In this keratin there is often included a colouring matter called melanin, varying in tone from straw colour to black. The huge number of hairs on the skin of most mammals provides an efficient mechanism for the conservation of heat.

Sweat is produced by glands distributed unevenly over the bodies of most, but not all, mammals. It helps in the removal of some waste products, and its evaporation leads to a great loss of heat. For this reason its controlled production plays a very important complementary part to that of hair in the regulation of temp. Further, sweat, in man for instance, where the hair is so much reduced, contains substances which absorb much of the radiation from the sun over a range of wavelengths which is most harmful in

producing sunburn, so that sufficient sweat is a protection.

The number of groups of sweat glands modified to produce milk is not constant from species to species, varying from a normal of two in man to a dozen or more in a sow. Even in man the number two is not constant. The condition of polymastia (many breastedness) is not uncommon. Tradition holds that Anne Boleyn had more than the usual complement; which fact is said to have fascinated Henry VIII with profound historical consequences. Any sweat gland, in either sex, seems able exceptionally to develop into a milk gland, and the removal of such unwanted formations is a part of surgical practice. The secretion of milk consists in the breakdown of the walls of the gland, built up during pregnancy and replenished during lactation.

Reproductive System

Associated with the retention of the embryo within the mother (a specialisation by no means confined to this group) we find, in the mammals, a profound modification of the vertebrate urino-genital system in both sexes. To ensure the meeting of sperm and egg (*see* Fertilisation) an intromittent organ is developed in the male to deliver the semen, consisting of sperms in a medium supplied partially by the prostate gland (*q.v.*), into or at the entrance of, the uterus, which is a part of the ordinary vertebrate oviduct modified to provide a suitable environment for the development of the embryo. To ensure that the female system shall interact correctly in time with the male system many mammals have retained a primitive response to the changing seasons, and breed at a season when both sexes are properly attuned to it.

The condition of being ready to breed is mediated by the secretions of the pituitary (*q.v.*), and, particularly in the female, an enormously complicated system of hormonal control has grown up, taking its time from the pituitary, to ensure that all the parts of the reproductive system, including the milk glands, act harmoniously and in step, so that, for instance, the expulsion of the embryo coincides in time with the production of milk. (*See also* Hormones; Menstruation, etc.)

Since teeth are extremely durable, it is from their teeth that many early mammalian forms are known as fossils. In the Jurassic the best authenticated mammals had three cusps to their grinding

teeth, and are called the Trituberculata from this quality. A number of unsuccessful groups branched off, some with many cusps, and by the beginning of the Cretaceous three groups are fairly clearly to be made out: (1) the ancestors of the duck-billed platypus and its allies; (2) the ancestors of the kangaroos and their allies; (3) the ancestors of the familiar mammals.

These three groups are made up today as follows:

THE SUB-CLASS MONOTREMATA. Here, as the name implies, the openings of the urino-genital system and of the rectum occur at the bottom of a single common depression. The duck-billed platypus (*Ornithorhynchus*) and the Australian spiny anteater (*Echidna*) lay eggs which are fertilised internally and develop a little before being laid. When laid they are placed by the mother in a ventral pouch where development is completed, the young animal being nourished by milk secreted by milk glands to which the embryo becomes closely attached. The sub-class is Australasian.

THE SUB-CLASS DITREMATA. Here, as the name implies, the openings of the urino-genital system and of the rectum are separate. In the sub-class there are two grades: (a) The Marsupialia (Australasian and American), in which the young are born very immature, are protected by the mother in a pouch or marsupium, and are fed by milk glands. Here are the kangaroos, opossums, bandicoots, phalangers, and their allies. (b) The Placentalia. In this group the embryo develops far more fully before being expelled from the uterus, and after birth the young are not protected in a marsupium. They are nourished, for a long time in some cases, with milk from the mother, who protects them from attack. The placenta (*q.v.*) permits the passage of nourishment, hormones, antibodies, and oxygen from the mother to the embryo and the passage of waste products, hormones, and antibodies from the embryo to the mother. This passage is via the blood streams of the two, which, however, never mix; diffusion takes place through thin membranes separating them.

In living or recently extinct placental mammals the following orders are commonly recognized:

(i) *Insectivora* including the hedgehogs, moles, and shrews. These are in many ways perhaps the most primitive of living mammals. The brain is very little more

developed than in some reptiles, being smooth and not convoluted.

(ii) *Cheiroptera*: the bats. Here the hand is modified for flight.

(iii) *Rodentia*, or gnawing animals, such as the rabbit, the rat, beavers, porcupines, and others.

(iv) *Carnivora*, or flesh-eaters. Here are the dogs, cats, wolves, tigers, weasels, bears, and seals. All have teeth more or less specialised for their diet of flesh. Many have developed great speed and strength for killing their prey.

(v) *Artiodactyla*, or hooved animals with even numbers of toes. Here are the cows, camels, pigs, deer, and sheep. Many of these animals chew the cud. Many run very fast. They frequently live in herds for mutual protection against the carnivores. Many of the males develop great strength.

(vi) *Cetacea*: the whales, in which the limbs are reduced and the animals have taken on a secondary fish-like shape.

(vii) *Perissodactyla*, or hooved animals with odd numbers of toes, such as the horse and the rhinoceros. These do not chew the cud, but have developed very great strength and speed as a protection against the carnivores.

(viii) *Proboscidea*, elephants.

(ix) *Sirenia*: the sea-cows. Here are the dugong and the manatee (*q.v.*), and the recently extinct huge Stella's Sea Cow (*q.v.*).

(x) *Hyracoidia*, e.g., Hyrax, the true coney of Scripture.

(xi) *Edentata*: a confused group, almost certainly not a true order. Here are the anteaters, the sloths, and the armadillo.

(xii) *Dermoptera*, the cobago or so-called flying lemur.

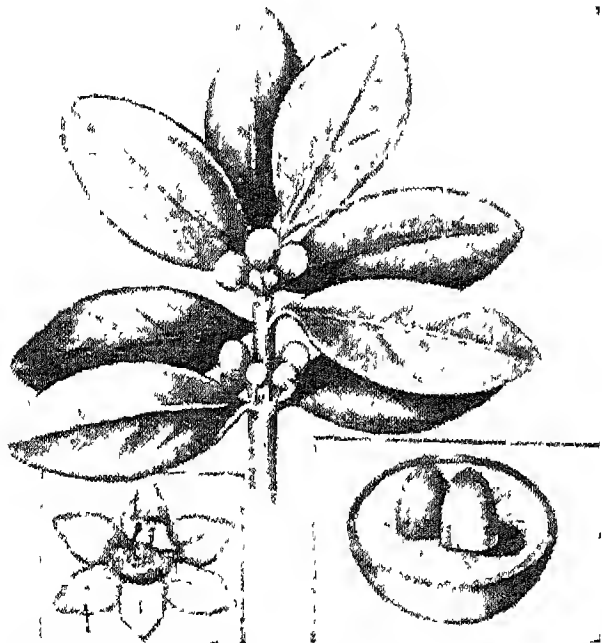
(xiii) *Primates*. Here are the true lemurs, the tarsoids, the Old and New World monkeys, the great apes, and man.

Further details may be found under the heading of any of these orders or of the animals mentioned as belonging to them.

Paul G. 'Espinasse

Bibliography. There are no up-to-date books dealing with the evolution and structure of mammals exclusively, but the older textbooks, written before much that is now known was discovered, are out-moded. The following books provide classifications and, in their bibliographies, an introduction to the more advanced study of the mammals: Vertebrate Zoology, G. R. de Beer, 1928; Studies in the Structure and Development of Vertebrates, E. S. Goodrich, 1930; Early Forerunners of Man, W. E. Le Gros Clark, 1934; Tempo and Mode in Evolution, Simpson, 1944; Mammals of Nevada, Hall, 1916.

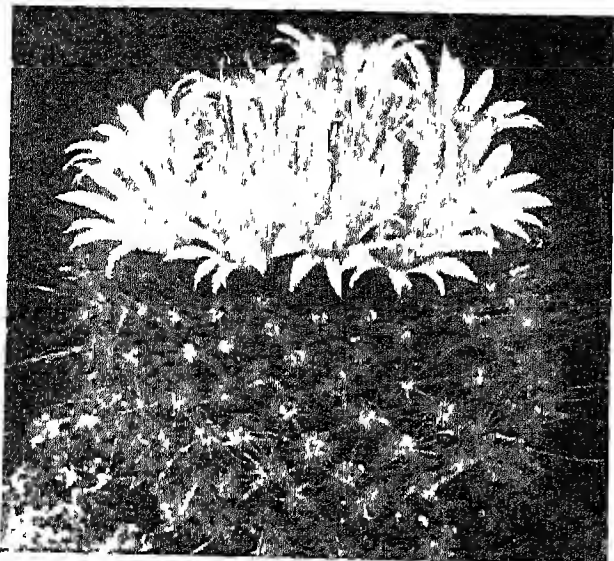
Mammee Apple (*Mammea americana*). A large tree of the family Guttiferae. It is a native



Mammee Apple. Foliage and fruit. Inset, left, flower; right, single fruit

of tropical America. It has large opposite, oval, leathery leaves, and sweet-scented showy white flowers, from which the aromatic liqueur *eau de Créole* is distilled. The yellow fruit is three or four ins. across, and within the bitter rind it contains a sweet, edible flesh. The large seeds are used medicinally, and a resin obtained from the bark is used to rid the feet of chigoes. It is sometimes called S. Domingo apricot, and derives its name from the Haitian name of the fruit, *mamey*.

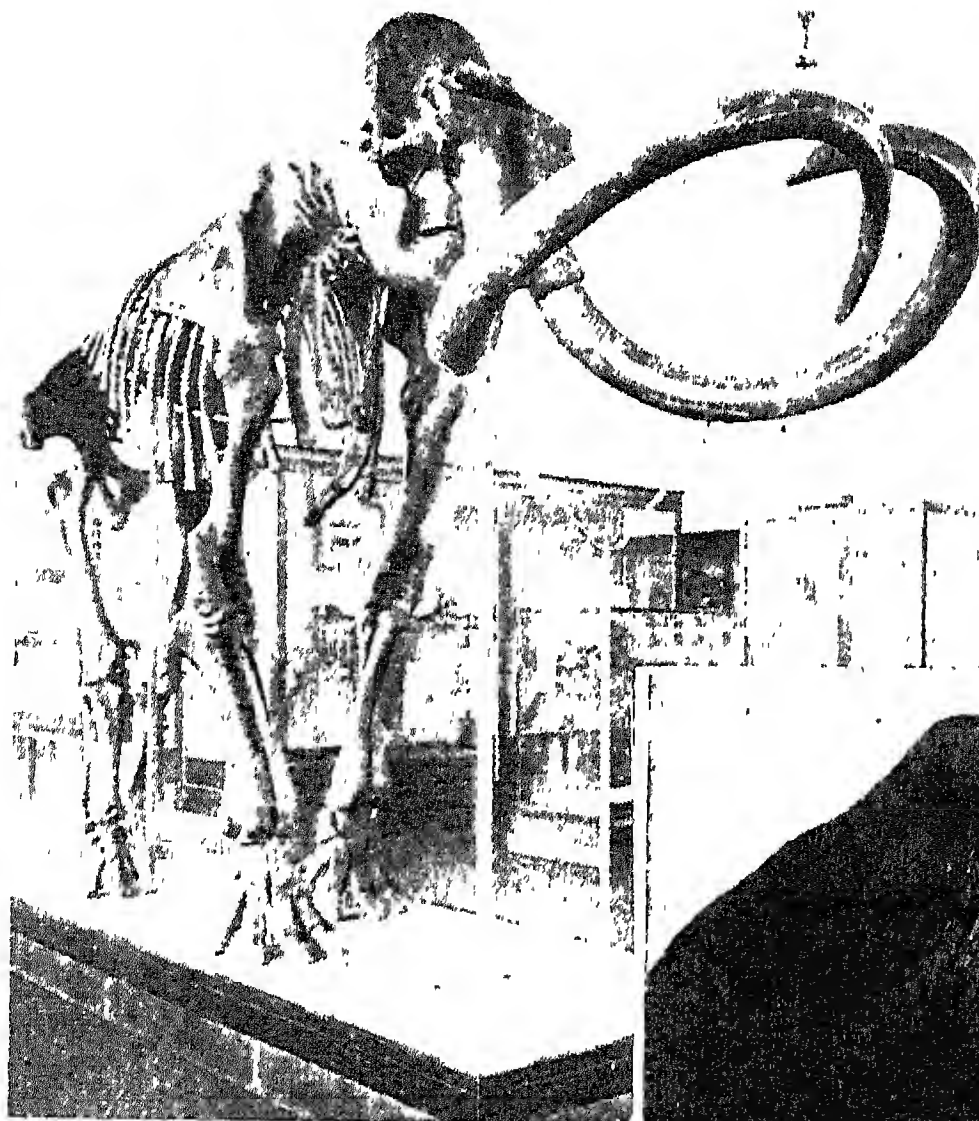
Mammillaria. Large genus of succulent perennials of the family Cactaceae. They are natives of the warmer regions of America,



Mammillaria. Stem and flowers of this type of cactus

especially Mexico. They have stems of cylindrical or globular form, studded with spirally arranged tubercles, which bear radiating spines and rose, white, or yellow flowers. These are followed by scarlet berry-like fruits.

Mammon (Aramaic *mamona*, riches). Phoenician term for gain. In the N.T. it implies love of money and deceitful wealth (Matt. 6, v. 24; Luke 16, vv. 9 and 13). The Book of Enoch, 62, v. 10, has the expression, mammon of unrighteousness, a later equivalent of which is filthy lucre. Milton, Pope, Byron, and Hood use the word, which is spelt Mammon in the R.V., as a proper name. In Jonson's play, *The Alchemist*, the character Sir Epicure Mammon is a luxurious seeker after boundless wealth. Carlyle uses Mammonism, and Tennyson Mammonite.



Mammoth

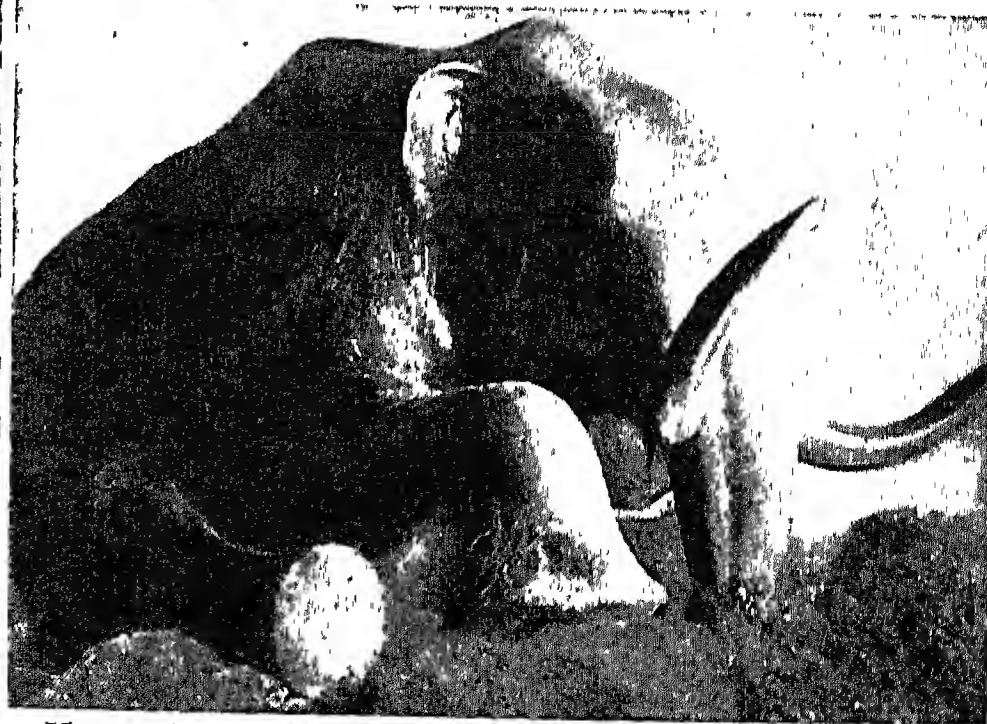
(*Elephas primigenius*).

Extinct elephant occurring in all N. continents. An inhabitant of central Europe in the Pleistocene period when the North Sea was covered by forest land, its remains have also been found throughout Asia and in N. America, whither it probably migrated. From fossil teeth and bones dredged from the North Sea, and from complete animals entombed in the ice, the whole

structure and general habits of mammoths have been ascertained. Despite the name, the average mammoth did not greatly exceed in size the African elephant of today, the largest mammoth discovered standing 13 ft. in height.

Generally closely resembling the Indian elephant, the mammoth had long and slender tusks which curled upwards and outwards, and was covered with long hair and a thick, woolly under-fur, these two characteristics differentiating it from the modern elephant. The animal was once very numerous. The disappearance of the pine forests, on the leaves and undergrowth of which it fed, led to the mammoth's extinction. Its fossil remains in Siberia supply large quantities of valuable ivory. One intact specimen discovered there had tusks 8 ft. long. Fragments of the limb bones of a mammoth were discovered in Regent Street, London, in 1921. Drawings of the mammoth, engraved on ivory by Palaeolithic cave-men, have been found in S. France. See Elephant; Ice Age; Mastodon.

Mammoth Cave. Limestone cavern in Edmondson co., Kentucky, U.S.A., about 85 m. by rly. S. by W. of Louisville. Mammoth Cave national park, 50,548 acres, and including a series of caverns, was created in 1936. Cave formations of St. Louis limestone and



Mammoth. Mounted specimen of Siberian mammoth, found preserved in the Arctic ice, now in the Leningrad Zoological Museum. Top, left (by courtesy of American Museum of Natural History), skeleton of Columbian mammoth, 10 ft. 6 ins. high at the shoulders, found in Indiana

Chester sandstone cover 8,000 sq. m. in central Kentucky, N. Tennessee, and S. Indiana. The surface area above Mammoth Cave is 10 m. in diam., but the length of the underground caverns, passages, etc., which are at five different levels, is 150 m. Colossal Cave, also in Edmondson co., is

almost the equal of Mammoth. The three rivers, two lakes, a sea, and many streams and pools link up with the Green river which passes by. Reverberations along the walls of the $\frac{3}{4}$ -m. long Echo river continue for 10–30 secs. The Main Cave is 40–300 ft. wide, reaches a height of 125 ft., and extends for 4 m. Indian councils were once held in chief city or temple, a part of the Main Cave which is 541 ft. long, 287 ft. wide, and 125 ft. high. Many mummies have been found. The cave, through which boat trips are conducted, has been so commercialised that meals are served in its banqueting hall, and weddings are solemnised at its bridal altar.

Many of the avenues are covered by a remarkable variety



Mammoth Cave, Kentucky. Portals of Vaughn's Dome, an enormous chamber within the cave, 26 ft. to 40 ft. wide, 300 ft. long, and 78 ft. high

By courtesy of the American Museum of Natural History

of crystals, and in the chambers stalagmites and stalactites abound. Notable geological formations, the nature of which is indicated by their names, are the pillars of Hercules, the giant's coffin, the star chamber, the marble temple, the Epsom salts deposits, the snowball room, the diamond grotto, the valley of flowers, and the florist's garden. The fauna of Mammoth Cave consists of blind fish and several insect species, while the outer galleries swarm with bats. The temp. remains at 54° throughout the year. The cave is mentioned in county records as far back as 1797. In the Rotunda, saltpetre was prepared for use in gunpowder during the War of 1812.

Mamoré. River of Bolivia. It rises in the Cochabamba mts. and the main stream, here called the

Rio Grande, follows a circuitous course round the E. end of the range and then flows N.N.W. to unite with the Beni to form the Madeira, an affluent of the Amazon. It is 1,300 m. long. Its chief tributary, the Guaporé, forms the N.W. boundary of Bolivia. These three rivers drain the greater part of Bolivia, and receive numerous affluents from the Andes and the heights of Matto Grosso.

MAN AND HIS EVOLUTION

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This article deals with man as a member of the animal kingdom, other aspects of the subject being under Anthropology and Ethnology. See Anatomy; Animal; Biology; Embryology; Heredity; Mammal; also Family; Society, and other articles on man's domestic activities

When Darwin published his classic work, *The Descent of Man*, in 1871, the evidence for the evolution of man from lower forms of life depended almost entirely on indirect evidence. At that time, fossil evidence of the past existence of primitive types of mankind was of negligible significance, and the general thesis for human evolution from an ape-like ancestry depended to a great extent on analogy with other groups of mammals (such as the horse) whose evolution seemed to be rather well attested by fossil remains of ancestral and intermediate types. But it also depended on such indirect evidence as may be obtained from comparative anatomical studies. For example, the striking similarity in structure between man and the anthropoid apes, bone for bone and muscle for muscle, even extending to the finer details of microscopic anatomy, suggested a community of origin from a common ancestral stock. The brain is very different in size, but it is built on the same basic plan.

Rudimentary Structures in Modern Man

Then there is the evidence of certain rudimentary structures constantly present in the human body, such as the bony nodules in the floor of the pelvis which evidently represent the remains of tail vertebrae, and the numerous little muscles attached to the ear which, in lower animals, render it mobile but in man appear to have lost this function. It is difficult to "explain" rudiments of this sort unless it is supposed that they are relics of the past when they were fully functional.

Again, during the development of the human embryo before birth, some structures that persist into the adult form of lower vertebrates put in only a temporary appear-

Mamore. A deer forest in Inverness-shire, Scotland. It lies between Ben Nevis and the head of Loch Leven, and covers about 32,000 acres. Fort William is the nearest place of importance.

Mam Soul OR MAM SODHAIL. Mountain on the borders of Inverness-shire and Ross and Cromarty, Scotland. It is 3,862 ft. high, and $3\frac{1}{2}$ m. W. of Loch Affric, from which it can be reached by a path.

ance, and, by doing so, seem to provide still further evidence of an evolutionary derivation from lower vertebrate levels. But, however cogent may be the cumulative effect of such evidence for human evolution, it remains only *indirect* evidence. This evidence may strongly suggest that man and the anthropoid apes have been derived by a gradual evolutionary diversification from a common ancestral stock; but it obviously calls for substantiation by the much more direct evidence that can be provided by fossil remains. If the hypothesis of human evolution were true, then intermediate forms linking modern man with the inferred ancestral stock must have existed in the past, and it is reasonable to suppose that their fossilised remains should come to light from time to time. It is with the direct evidence derived from the study of fossils (palaentology) that this article is concerned.

Dating Fossil Remains

Before giving a brief account of the fossil remains of early types of man (and of extinct ape-like creatures perhaps closely related to the ancestral stock that actually gave rise to man) it is convenient here to make a brief reference to the dating of fossil remains. The relative antiquity of a fossil skull may often be determined by the geological evidence alone, that is to say, by the characteristics of the stratified deposits in which it was found. The age of a deposit may also be inferred from the kind of extinct animals whose fossilised remains are found in it (for each successive geological period can often be distinguished by its particular fauna). If a skull is found in association with stone implements, the latter may provide a clue to its antiquity, since it

is known that different phases in the cultural development of the Stone Age were characterised by different types of implement. But the question may arise whether a human skull is actually contemporaneous with the deposit in which it is found, or whether it

successive glaciations can be detected by the characteristic geological deposits left by melting ice and so forth, and this sort of geological evidence provides a *relative* chronology whereby it may be possible to assign the fossil remains of man to one of the glacial or interglacial phases. Attempts have also been made to establish an *absolute* chronology, so that each phase of the Ice Age can be dated in terms of so many thousands of years. Although there is much uncertainty in this difficult problem, there is also some measure of agreement, at least of an approximate nature.

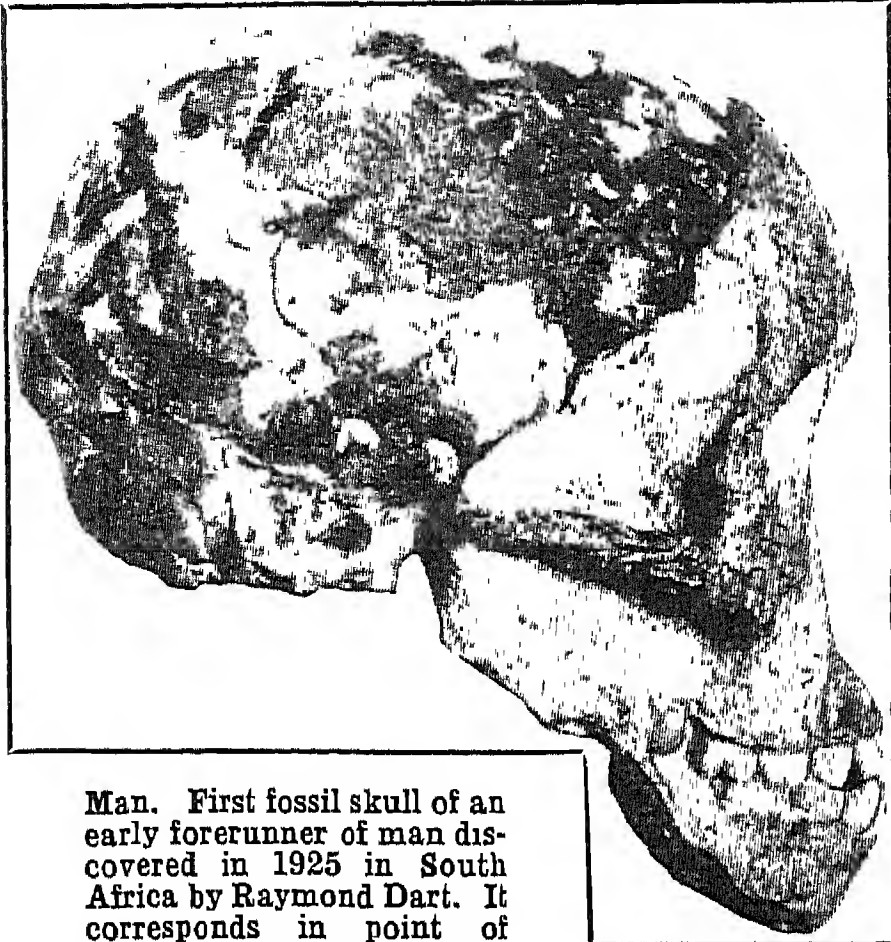
Modern man belongs to the species *Homo sapiens*. He is known by fossil remains to have lived in Europe during the

later phases of the last glaciation (for example, Cromagnon man, and his predecessors of the reindeer period), and even then had a relatively highly developed culture. At a still earlier period, during the onset of the last glaciation, perhaps 50,000 years or more ago, there lived in Europe a peculiar type of mankind often called Neanderthal man (for the reason that the first described example consisted of skeletal remains found in a cave of the Neander valley in Germany). He was associated with a phase of Palaeolithic culture called the Mousterian.

Many remains of Neanderthal man are known and they all show remarkably primitive and ape-like characters. For example, the forehead was low and receding, the eyebrow region was marked by heavy overhanging bony ridges, the top of the skull was very flat, the jaws were massive and projecting, and there was no well-developed chin. These (and many other characters of the skull, teeth, and limb bones) were at one time taken to indicate an early stage in the evolutionary development of *Homo sapiens*, and thus seemed to provide convincing evidence of an intermediate form bridging the gap between modern man and his presumed simian ancestors. However, later discoveries have made it clear that, even before Neanderthal man appeared in Europe,

human beings closely similar to *Homo sapiens* had already come into existence. It is now generally accepted, therefore, that Neanderthal man was, so to speak, a side line of evolution produced by retrogressive changes and that he became extinct by the end of the last glaciation. Thus, he could have had no relation to the origin of *Homo sapiens*. In this connexion it is interesting to note that Neanderthal man (in spite of his seemingly primitive character) had a large brain; indeed, its average size appears actually to have exceeded that of present-day man.

The example of Neanderthal man needs to be carefully noted, for it shows how students of human evolution may be misled by too scanty palaeontological evidence. The fact is that the fossil remains of early types of man are far too few to permit definite statements regarding the exact course of human evolution, or even the precise relationship between one fossil type and another. Palaeontologists can do no more than scrutinise carefully the existing fossil evidence and put forward a provisional interpreta-

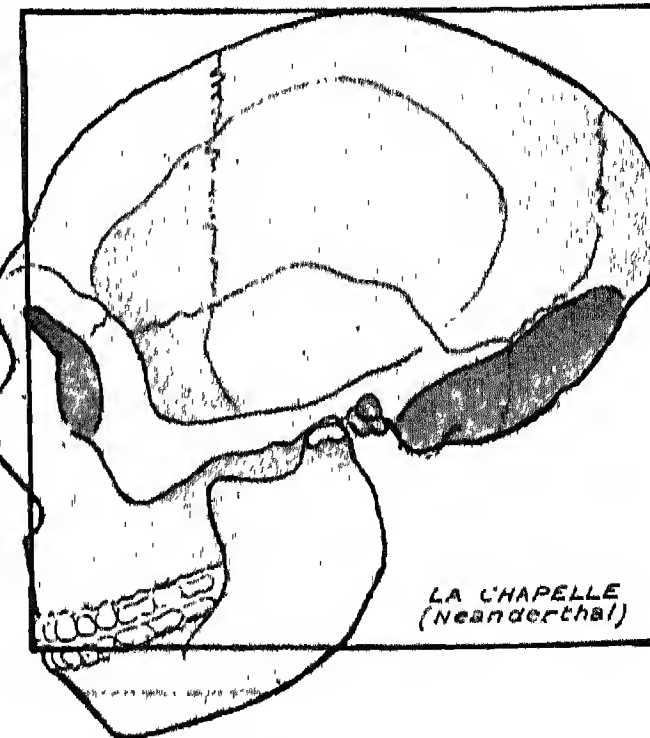
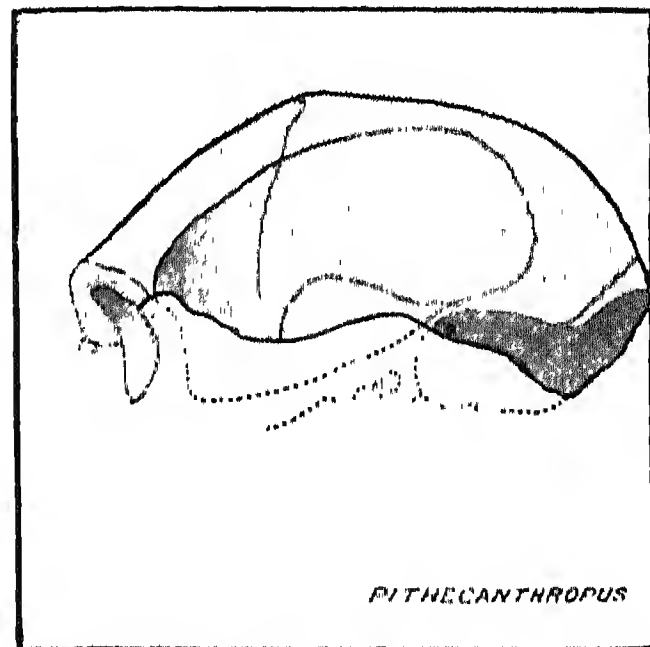


Man. First fossil skull of an early forerunner of man discovered in 1925 in South Africa by Raymond Dart. It corresponds in point of growth to that of a human child of six years

may have been placed there as the result of a burial at a date long subsequently.

The fluorine method helps to solve such a problem; it depends on the fact that during the process of fossilisation bones slowly take up fluorine from the soil so that this chemical element gradually accumulates in increasing quantity. If, therefore, a human skull is found side by side with bones of extinct mammals, and their fluorine content is found on chemical analysis to be identical, it may be inferred that they are contemporaneous in the sense that they were deposited at approximately the same time. On the other hand, if the fluorine content of the human skull is found to be very much less than that of the fossil mammal bones associated with it, it is to be inferred that the skull must be of much later date and may even represent a relatively recent interment.

During the geological period (called the Pleistocene period) when the later phases of human evolution occurred, much of Europe was intermittently exposed to an intensely cold climate, accompanied by extensive glaciation. It is generally agreed that there were four major glaciations, each being followed by a retreat of the ice and the onset of a warmer interglacial period. Traces of the



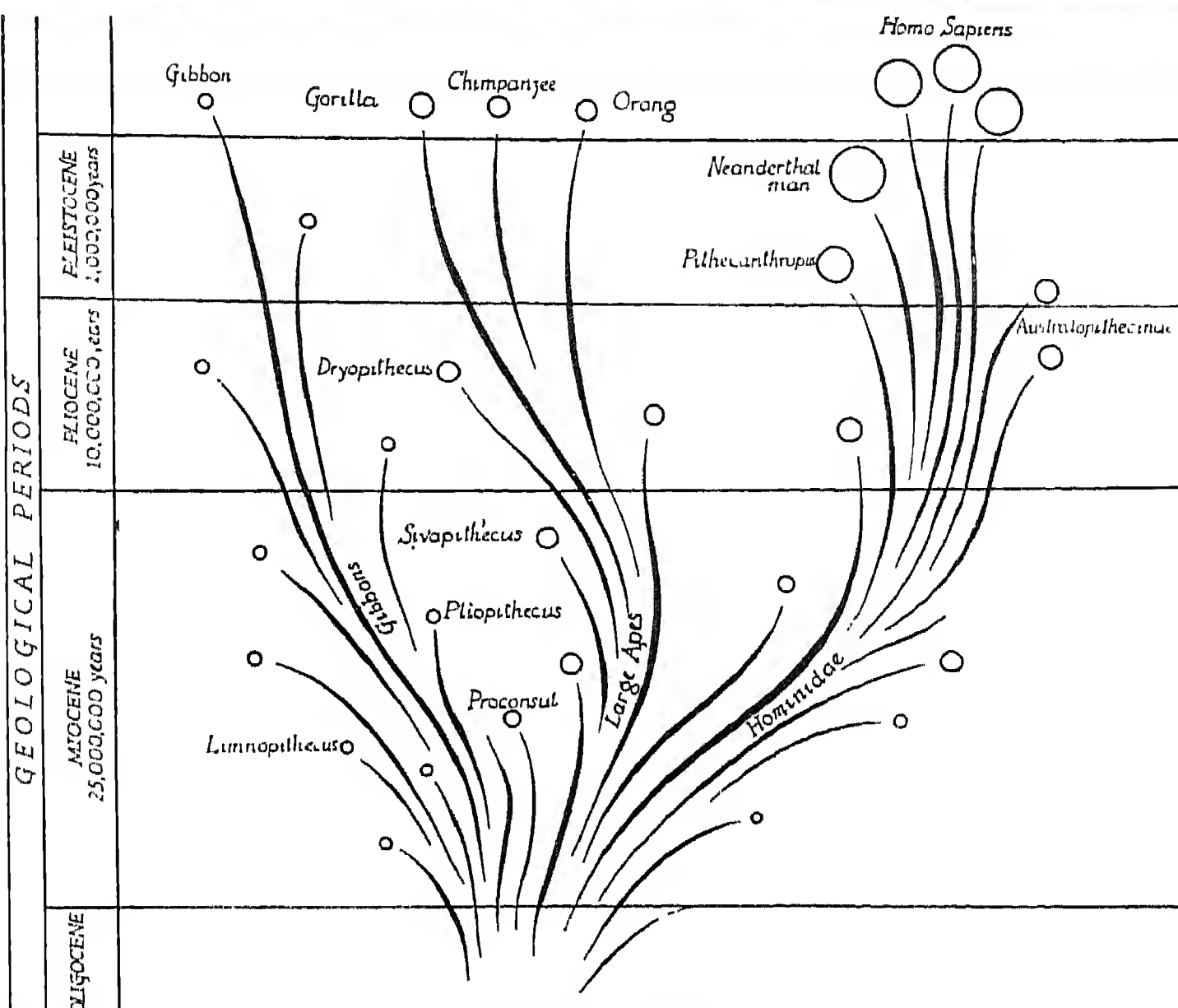
Man. Comparative size of the skulls of two types of primitive man, based upon fossil remains. Each side of the ruled squares represents 200 millimetres (7·87 ins.)

tion which best fits the facts so far as these are available at a given moment. It is like trying to place in their proper positions the pieces of a jig-saw puzzle while many of the pieces are still missing. The discovery of the missing pieces may call for some readjustment of those already in provisional positions. The reader should bear in mind this analogy when he comes to consider the tentative conclusions offered on the basis of the fossil material referred to in this article.

Human beings not very different from *Homo sapiens* existed in pre-Mousterian days. For example, in 1935, the bones of the roof and back of a skull (the parietal and occipital bones) were discovered in an excellent state of preservation in a gravel pit at Swanscombe in Kent. On the geological evidence, as well as the evidence of the flint implements and the fossil mammal bones found with it, the skull was dated with considerable confidence to the second interglacial period, a period estimated to be as much as 200,000 years old. With the possible exception of one or two minor features, the skull bones are not to be distinguished from those of *Homo sapiens*. Certainly, they show none of the characters distinctive of Neanderthal man.

The top part of another skull of similar type was found at Fontéchevade in France, in 1947, and this specimen also can be dated with reasonable certainty to pre-Mousterian times. A more complete skull, found at Steinheim in Germany in 1933, is believed to date from either the second or the third interglacial period. It has strongly developed brow ridges (but not to the exaggerated extent seen in Neanderthal man), a rather massive upper jaw, and a brain capacity estimated at about 1,000 c.c. (the average capacity in modern man, it may be noted, is approximately 1,350 c.c.). In spite of the fact that it displays a few somewhat primitive features, it would be difficult on the basis of this fossil skull to separate the man of Steinheim from *Homo sapiens*.

If *Homo sapiens* dates back to the second or third interglacial period, this species clearly has a much greater antiquity than many



Man. Chart showing the probable relationship of modern man (*Homo sapiens*) to fossil man and fossil apes. The chart is based on available fossil evidence. The circles represent the relative sizes of the brain in man and apes, modern and extinct. The ancestors of the human family (*Hominidae*) probably separated from the lineage of the anthropoid apes in the Miocene period, and the chart makes it clear that the earliest representatives of the *Hominidae* would not be distinguishable from the apes by size of brain alone.

anthropologists in the past have supposed. The question next arises—what fossil evidence is there of still earlier types which may give some indication of evolutionary development from ape-like ancestors? In 1907 there was discovered in a gravel pit near Heidelberg a large lower jaw of exceedingly primitive type. It was associated with the remains of an extinct elephant and rhinoceros characteristic of the early part of the Pleistocene period, and it probably dates from the beginning of the first interglacial period, which gives it an antiquity of not much less than half a million years. No flint implements were found with the fossil. The jaw is remarkable for its massive construction and for the complete absence of a chin eminence. Thus, in its general build, it has a distinctly simian appearance. On the other hand the teeth are fundamentally of the human type. Here, then, is an ancient fossil specimen which seems to combine human and simian features in a way that bears out the inferences regarding human evolution originally based only on indirect evidence.

Mention may be made here of the remains found at Piltdown in Sussex from 1912 onwards. These

consisted of several cranial fragments very similar to those of modern man except for their remarkable thickness, and part of a lower jaw. The lower jaw, in strong contrast to the cranium, showed such striking simian characters (particularly in the large pointed canine tooth) that some regarded it as the jaw of a fossil ape which had become accidentally mixed up with the remains of a human skull. Those who took the view that the jaw and cranium belonged to the same individual came to the conclusion that they represented an extremely primitive type of man to which the name *Eoanthropus* (the dawn man) was given; and these remains were thought to be possibly the oldest human remains in Britain, and very considerable antiquity, dating back to the early part of the Pleistocene period, was assigned to them. But scientific tests made in 1953 demonstrated the lower jaw to be a remarkable forgery: that of a modern large ape which had been skilfully treated to simulate an actual fossil and "planted" at the site of the previous discovery of the cranial fragments. The cranial fragments themselves are genuine fossils; but they are probably no older than the latter part of the Pleistocene, and



Man. Types of primitive man illustrated by reconstructions, showing the increasing intelligence indicated by greater prominence of chin, reduction of eyebrow ridges, and increased size of skull with proportionately greater brain capacity. Left to right, trinit or ape-man of Java, *Pithecanthropus erectus*; Neanderthal man, *Homo neanderthalensis*; Cro-magnon man, *Homo sapiens*

From restorations by J. H. McGregor; by courtesy of the American Museum of Natural History

represent an early type of *Homo Sapiens*. The discovery of this forgery in fact greatly clarified the problem of evolution, for the combination of such a modern type of cranium with such a simian jaw had always been difficult to explain.

A primitive type of early man, *Pithecanthropus* lived in the Far East during the early and middle Pleistocene. Remains of this extinct creature, consisting of a skull cap and a thigh bone, were first found in Java in 1891. The skull cap gave evidence of an exceptionally small brain (about 900 c.c.), enormous brow ridges, and a complete lack of forehead. On the other hand, the thigh bone is similar to that of *Homo sapiens*. This curious combination of anatomical characters led their discoverer to invent the name *Pithecanthropus*, or ape-man. Many years later more skulls and jaws of *Pithecanthropus* were found in Java, one with a brain capacity estimated to be only about 775 c.c. This may be compared with the maximum capacity hitherto recorded in a gorilla, 685 c.c., from which it will be evident that, so far as brain size is concerned, the gap between ape and man had become reduced to a very small margin indeed. Other remains of *Pithecanthropus* were discovered in cave deposits in China near Peking—several skulls, many jaws and teeth, and a few rather fragmentary limb bones. These fossils were at first assigned to a new genus, *Sinanthropus*, but it was later agreed that they represent no more than a local variant of *Pithecanthropus*.

The anatomical characters of *Pithecanthropus* can be stated

quite briefly. The average size of the brain was only about 1,000 c.c., the top of the skull was markedly flattened, the forehead was virtually absent, the eye sockets were overhung by massive brow ridges, the jaws were of huge size and the teeth showed many simian characters (particularly in the large, almost tusk-like, canines). But in spite of these primitive traits, it appears certain that *Pithecanthropus* had developed an intelligence that can only be called "human." For there is evidence that he was capable of fabricating stone implements (though of rather a crude type), and that he had even learnt the use of fire. He also lived in communities and was a skilful hunter. Yet it is estimated, on geological data, that he may have lived as much as 500,000 years ago, and it is perhaps a matter for surprise that at such an early date human evolution had already progressed thus far. *Pithecanthropus* is certainly to be regarded as "man" in the ordinary sense of this term, but he retained in his anatomical structure a number of remarkably ape-like characters that have disappeared in modern types of mankind.

Although *Pithecanthropus* goes back an appreciable way towards the ape, he can hardly be said to represent a really intermediate or transitional stage from the simian to the human level of evolution. Presumably, if the generally accepted conception of human evolution is correct, he must have been preceded by still more primitive and smaller-brained beings. It might have been anticipated that when the remains of such creatures were found, it would be an extremely difficult matter to decide

whether they were very early members of the human family (*Hominidae*) or whether they represented an aberrant (and now extinct) branch of the ape family (*Pongidae*) which had developed certain human characters independently of the evolution of the *Hominidae*. The size of the brain would not help in deciding the question, for it is to be expected that the earliest representatives of the *Hominidae* (soon after their segregation from the *Pongidae* in their evolutionary divergence from a common ancestral stock) would not yet have developed brains significantly larger than those of the modern large apes. Indeed, as has already been mentioned, the difference between the smallest *Pithecanthropus* brain and the largest gorilla brain was less than 100 c.c.

There have been found in South Africa the fossil remains of some very remarkable ape-like creatures considered by many authorities to represent a phase of hominid evolution closely corresponding to that which must have preceded *Pithecanthropus*. Just because these South African fossils do show such a remarkable combination of simian and hominid characters, they have given rise to considerable controversy.

The first of the S. African fossils to be found, the skull of an immature individual, was described by Raymond Dart (b. 1893) in 1925. He gave the name *Australopithecus* (southern ape) to the specimen. In later years more remains were discovered by Robert Broom (1867-1951) in stalagmitic deposits a few miles from Johannesburg, including many skulls and portions of skulls, jaws, teeth, and limb

bones. All these fossils have been assigned to the same group, which is collectively termed the *Australopithecinae*. The main characters of these remarkable creatures may be summarised as follows.

The brain capacity was small—indeed, it appears hardly to have exceeded that of a large gorilla. The jaws were of huge size, and the grinding teeth very large. In its general proportions, therefore, the *Australopithecine* skull is extremely ape-like. On the other hand, in a number of constructional details it shows definitely hominid characters. For example, the vault of the skull rises to a height not found in apes of comparable size. The articular surfaces on the base of the skull, whereby the latter makes a joint with the top of the spine, are situated relatively further forward than in apes, suggesting that the head was held more erectly. The muscular ridges at the back of the skull are much lower in position than in apes—another indication of a different poise of the head. Several morphological details of the bony ear region and the inside of the base of the skull have a hominid appearance that finds no exact parallel in apes.

The canine teeth are (as in man) of blunt spatulate form, not projecting to any marked degree above the level of the adjacent teeth, and they become worn down flat from the tip by attrition against the opposing canine. By contrast, in all apes (modern or extinct) the canines are relatively large and tusk-like, and they become worn obliquely fore and aft as the result of interlocking with adjacent teeth of the opposite jaw. In the upper jaw of all apes (save very exceptionally) the canine and the incisor teeth are separated by a conspicuous gap, the *diastema*; in all the upper jaws of the *Australopithecinae* so far discovered (more than ten at the time of writing) there is no trace of a diastema. In man, the crown of the first bicuspid tooth of the lower dentition is composed of two cusps of comparable size placed side by side; the South African fossils follow the hominid pattern, and thus contrast quite strongly with all apes, in which this tooth is composed mainly or entirely of a single large pointed cusp disposed obliquely. The milk canines and the milk molars of the fossils are likewise human in their constructional details and very different from those of apes. Thus it will

be seen that the evidence provided by the teeth conforms entirely with that of the skull structure.

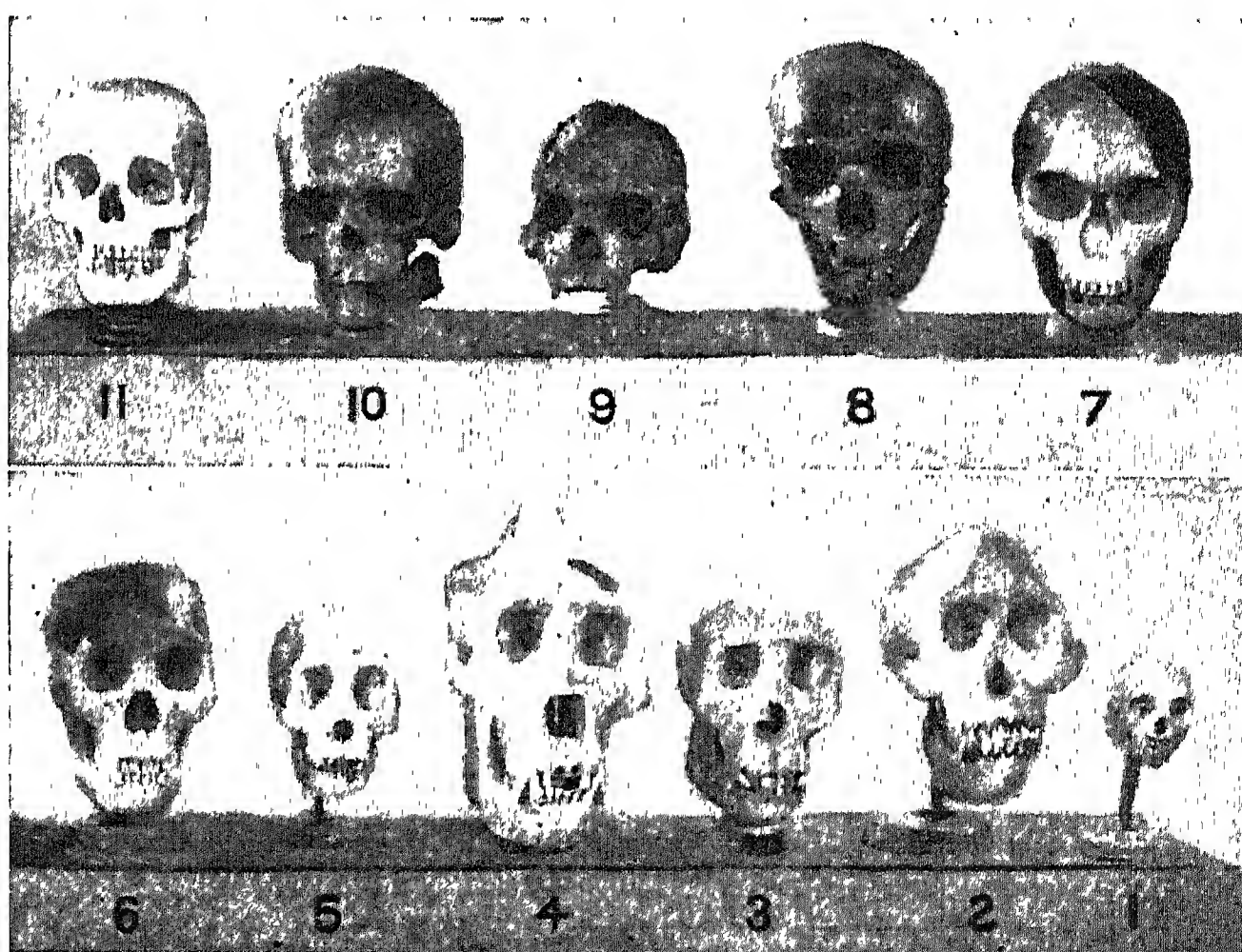
The limb bones of the *Australopithecinae* are very remarkable. Indeed, some of them are so human in shape and proportion that at first a few critics refused to believe that they really belonged to creatures with such small brains. But they were excavated by competent experts and most of them were found in immediate association with *Australopithecine* skulls and teeth, embedded in a dense stalagmitic matrix. No part of the skeleton is more distinctive of man as compared with the anthropoid apes than the pelvis. In apes the blade of the hip bone is narrow and elongated (as it is in mammals generally). In man it is broad and flattened to provide muscle attachments adapted for standing and walking in the erect posture. Similar differences are to be seen in the relationships between the joint socket for the thigh bone, the articular surface for the sacrum, and the ischial tuberosity (haunch bone), and also in many other anatomical details. In all these respects the *Australopithecine* pelvis conforms to the human pattern (even though it shows some unusual morphological features that do not appear to be exactly paralleled in modern man).

Since the shape and proportions of the human pelvis are quite evidently adaptations to the erect posture, it seems clear from the

evidence of this bone that the extinct ape-like creatures of South Africa were capable of standing and walking somewhat as mankind does today (but no doubt less perfectly). This conclusion is also consistent with the anatomical evidence of the thigh bone, as well as with certain features of the base of the skull. It is also consistent with the climatic evidence, for this indicates that the *Australopithecinae* lived, not in a forest environment like the modern anthropoid apes, but in a somewhat arid environment, so that they must presumably have been well adapted for terrestrial life.

There is general agreement (particularly among those who have actually studied the original remains) that the fossil *Australopithecinae* exhibit a most astonishing combination of simian and hominid characters. But it is by no means certain that they represent the ancestral stock which gave rise to modern man. On the other hand, it seems very probable that they were at least closely related to the ancestral stock.

One important conclusion seems assured: that in the evolution of man from an ape-like ancestor the hominid modifications of the dentition, and the adaptation of the limbs and pelvis for upright progression, preceded any marked expansion of the brain. It follows from this that the *Australopithecinae*, in spite of their small brain, should properly speaking



Man. Skulls of certain anthropoid apes and of types of primitive man, shown together for comparison. 1. Gibbon. 2. Orang Utan. 3. Chimpanzee. 4. Gorilla, adult. 5. Gorilla, young. 6. Pithecanthropus. 7. "Piltdown man". 8. Neanderthal man. 9. Talgai man. 10. Cromagnon man. 11. Recent

By courtesy of the American Museum of Natural History

be placed not in the family *Pongidae* but in the *Hominidae*, even though they may have been a side-branch and not directly ancestral to any of the modern and extinct varieties of mankind. There is without doubt a greater morphological hiatus between the anthropoid apes and the South African *Australopithecinae* than between the *Australopithecinae* and primitive hominids such as *Pithecanthropus*. For it is difficult to formulate any really fundamental differences between *Pithecanthropus* and the *Australopithecinae* except the gross size of the brain (and even here the contrast is not very great).

A great many varieties of fossil apes are known, dating from the geological periods of the Pliocene and Miocene, and extending in antiquity as far back as about 30 million years. The larger genera include *Dryopithecus*, *Sivapithecus*, and *Proconsul*, of which the last is the most ancient, and inhabited East Africa in the early part of the Miocene. A number of primitive gibbons (*Pliopithecus* and *Limnopithecus*) are also known from Miocene deposits. In their dentition all these extinct apes show most of the characteristic features of the modern apes—for example, the large tusk-like canine teeth and the pointed shape of the first lower bicuspid. But in the skull and limb bones they were more primitive, and in a number of characters they resembled the quadrupedal monkeys rather than the modern arboreal anthropoid apes. So far as the limb skeleton is concerned, this has an indirect (but quite important) reference to the problem of human evolution. Some comparative anatomists in the past have argued against the conception of the evolutionary origin of man from a simian ancestor, on the grounds that anthropoid apes (in relation to their arboreal habits) have developed certain aberrant specialisations such as disproportionately long arms, a degeneration of the thumb, and so forth. Since such specialisations have been avoided in man (who, in these respects, is actually more primitive than the modern anthropoid apes), this argument seemed to have some force. But it has become apparent that in the early apes of Miocene times, the extreme limb specialisations of the modern apes had not yet been developed—they still retained proportions of a more primitive type. This dis-

covery thus removes the main theoretical difficulty advanced against the presumed relationship between man and apes.

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Man, ISLE OF. Island in the Irish Sea. Part of the British Commonwealth, it has a government and constitution distinct from that of the United Kingdom, although the imperial parliament exercises certain powers over it. It is 27 m. from the W. coast of England, and about the same from both Scotland and Ireland; with a length of 33 m. and a breadth of 12 m., it has an area of 221 sq. m. Belonging to it is a small island on the S., the Calf of Man. The pop. of the Isle of Man was 55,213 in 1951.

The coast, in which are a number of bays and other openings, is in the main rugged, and the interior is hilly. A range of hills stretches from N.E. to S.W., the highest point being Snaefell, 2,034 ft. Between the hills are beautiful glens. There are no lakes, but a number of streams add to the beauty of the scenery. Douglas is the capital and the largest town. Other towns are Castletown, the old capital, Peel, and Ramsey, while Port Erin, Port St. Mary, Kirkmichael,

and Laxey are among the smaller towns on the coast. The climate is mild; fuchsias and myrtles grow in profusion in the open. Snipe are found, but there is no abundance of game. The island is known, however, for its breed of tailless cats. The coat of arms is three legs, taken, it is said, from a pillar cross at St. Maughold.

The soil of the island is not very fertile, but nearly half the total area is cultivated. Oats, barley, wheat, and turnips are the chief crops. Dairy farming is carried on, and much of the land affords pasture for cattle, horses, and sheep. There is a coasting trade, and some of the inhabitants are employed in the herring fishing, but the fisheries are less important than formerly: 88 fishing vessels were registered in 1956 compared with 169 in 1944. A rly. system of about 70 m. links the principal towns, and there is an electric tramway from Douglas to Ramsey. There is regular steamboat and air communication with Liverpool, Fleetwood, Glasgow, Dublin, Belfast, and other places. There are a few domestic industries, but many of the inhabitants obtain a livelihood by providing for visitors. The provision of cheap and rapid transit in the 19th century made the island, especially Douglas, a very popular pleasure resort.

The island is governed by a lieutenant-governor appointed by the crown, a legislative council consisting of the bishop, deemsters, and other officials, and the house of keys, an elected body of 24. These two bodies form the court of Tynwald, which is the executive as well as



Isle of Man arms



Isle of Man. Map of the self-governing island in the Irish Sea, showing many favourite resorts of visitors from the mainland

the legislative authority. The lieutenant-governor is its president. Electorally the Isle is divided into six sheadings, in addition to the four towns. There are seventeen ancient parishes.

The island revenue comes mainly from the customs duties, and of it £10,000 a year is paid to the imperial exchequer.

There is a high court of justice which has common law and chancery divisions, with a court of appeal. In the common law courts the deemsters are the judges, and they also hold courts of summary jurisdiction. There are also magistrates, whose duties resemble those of their fellows in England. The law relating to real property differs from that of England, but most of the other branches have been made similar. The Isle of Man is not bound by acts of the British parliament unless specifically mentioned in them. The island has its own bishop, Sodor and Man, who has his own ecclesiastical organization. The diocese is part of the Church of England, being in the province of York, although there was once a separate Manx Church.

History of the Isle

Mona, the old name of the island, comes from an old Irish word meaning hill country. The Isle of Man was inhabited in early times by a Gaelic people whose language was the ancestor of Manx. There are many remains of prehistoric man, including stone circles, cairns, mounds, and lake dwellings. In the 6th and 7th centuries the people were converted to Christianity by Irish missionaries, and runic crosses of the period survive. Before 700 the Isle was conquered by Scandinavian rovers, and it remained under their rule for a long time, although such was not always effective.

The kings of Norway succeeded to this Scandinavian conquest, and Magnus Barefoot made his authority real by his presence in the island, but soon the kings of Scotland appeared as rivals. The result was that, after the Scots defeated the Norwegians at Largs in 1263, the island was handed over, in return for a sum of money, to Scotland. The Scots were not liked; an appeal brought Edward I to the aid of the Manx, and after a time the sovereignty of England was firmly established. In 1406 Henry IV gave the island to Sir John Stanley, and the Stanleys, earls of Derby, were lords of Man until 1736. During the time of the Commonwealth the island was

taken from the 7th earl, in spite of the gallantry of his wife. This was the time when the native hero, William Christian, executed at the Restoration, led the people in a revolt against the Stanley rule, which was in some respects oppressive.

In 1736 the lordship passed to the duke of Atholl, a relation of the earls of Derby. In 1765 the sovereign rights of the duke were bought by the English crown for £70,000. The main reason for this was that the island had become a great centre for smuggling; but smuggling continued. In 1828 the remaining rights of the duke of Atholl were purchased for £417,000. The British parliament then exercised sovereignty, but in 1866 greater powers of home rule were given to the island authorities.

During the First Great War there were internment camps housing enemy aliens at Knockaloe and Douglas, and at the outbreak of the Second Great War similar camps were established on the island, being followed by others for prisoners of war; the principal sites were at Douglas, Ramsey, Peel, and Port Erin. A number of persons arrested under regulation 18b, including Sir Oswald Mosley, were detained on the island. The R.A.F. No. 1 Ground Gunnery School was located at Douglas and Castletown, 1940-42; and the R.A.F. Regt. No. 2 Training Centre was at Castletown during 1942-43; a Royal Navy training establishment for boys was at Douglas, 1943-45.

Limited conscription was introduced in Oct., 1939. In 1942 the Tynwald rejected extended conscription under the National Service (No. 2) Act of Dec., 1941, but in 1948 it reversed this decision.

The Isle has produced literary men of some importance, including the poet T. E. Brown and Hall Caine, a number of whose novels, e.g. *The Manxman*, *The Deemster*, *The Master of Man*, *The Woman of Knockaloe*, are set in the island. See also *Manx Language and Literature*.

Man, HENRI DE (1885-1953). Belgian politician and writer. He was born at Antwerp, educated at Brussels, Leipzig, and Vienna. In 1911 he became director of a committee of labour education, and during 1920-22 was principal of the Belgian labour college. During 1920-32 he held various professional posts at Brussels and Frankfurt-on-Main. He gained international reputation by his views on socialism expressed in his

books *Remaking of a Mind*, 1919; *Psychology of Socialism*, 1927; *Joy in Work*, 1928; *The Socialist Idea*, 1933; *The Belgian Plan of Work*, 1933. His views were much quoted by the Nazis. On the strength of his published work he was appointed minister of public works and unemployment, 1935-36; minister of finance, 1936-38. At one time vice-president of the Belgian labour party, he resigned from it simultaneously with giving up his portfolio, and founded a pro-Nazi party. He started two journals, *Le Peuple*, 1941, and shortly afterwards *Le Travailleur*, which was German-controlled. Deprived of his nationality in 1946 for collaboration with the Germans during their occupation of Belgium, he died in a motor accident in Switzerland June 20, 1953.

Mana. A native term of the Pacific region for an impersonal supernatural power believed to act, for good or ill, through a material vehicle. Mana is communicated to the medium (a bone, stone, water) by any personality already possessing it, who may be a living man, disembodied spirit, or supernatural being.

Manaar. Gulf and island between Madras state and Ceylon. The island, with Adam's Bridge and Ramesvaram island, forms an almost continuous ridge between Ceylon and the Deccan; Pamban Passage lies to the W. end, and Manaar Island is near Ceylon, to which it belongs. The gulf lies S.W. of the island, and is so shallow that ocean steamers must pass S. of Ceylon on the route from Cape Comorin to Madras and Calcutta. Manaar town lies under the shadow of an old Dutch fort, and its church contains Portuguese tombstones of the 16th century.

Pearl fishing had a meteoric life in Manaar. The first fishing in 1905 produced 50 million oysters. The industry went into liquidation in 1912, was taken over by the govt., but ceased in 1925. Tre-pang (*bêche-de-mer*) is obtained near Ramesvaram.

Manabi. A maritime prov. of Ecuador, bordering on the Pacific Ocean. Its surface is hilly and well forested; the ground is fertile, and sugar and cocoa are produced. Area 7,320 sq. m. Pop. (1955 est.) 478,000. The capital is Puertoviejo.

Manacle Rocks. Dangerous reef off St. Keverne, Cornwall, England, 7 m. S. of Falmouth. The Manacles, as they are called, have been the scene of many shipwrecks, notably that of the emigrant

vessel, John, May 1, 1855, in which 200 lives were lost.

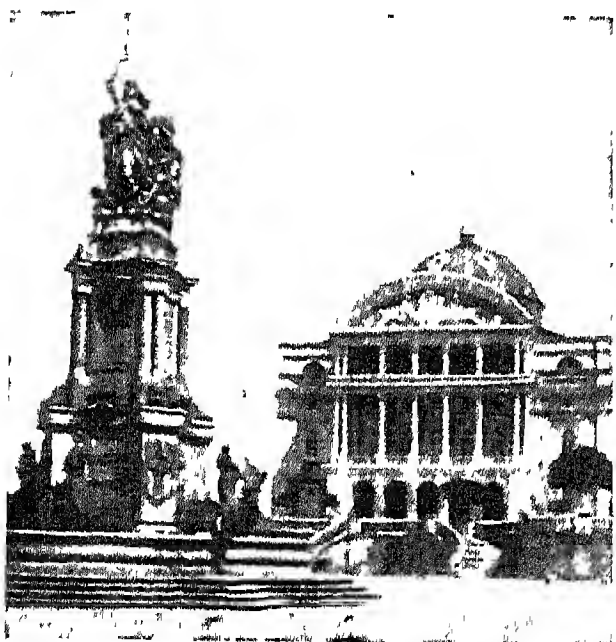
Manacor. Town of Spain, on the island of Majorca, Balearic Islands. It stands near the E. coast, is well built and spacious, and contains many fine buildings, among them a palace of the king of Majorca. Trade is carried on in wine, fruit, oil, cereals, and cattle. Manacor is the starting point for visits to the caves of Drach and Artá. Pop. (1950) 18,956.

Mána Ghat. Pass over the Himalayas, linking the Garhwal district of Uttar Union, India, with Tibet. It is used by Hindu pilgrims on their journeys to Lake Manasarowar. It rises to more than 16,000 ft.

Managua. Lake of Nicaragua, Central America, on the W. side of the republic. It has a length of 32 m., and a width of 16 m. and is picturesquely situated 30 ft. above the level of Lake Nicaragua, into which it drains by the Tipitapa river.

Managua. Town of Nicaragua, Central America, the capital of the republic, and of the dept. of Managua. It stands on Lake Managua, is connected by rly. with Granada and the port of Corinto, and is a mart for the coffee locally grown. It has a national palace, a town hall, and a museum. In 1931 the city was almost entirely destroyed by earthquake, but was rebuilt. Pop. (1954) 176,569.

Manahiki OR MANIHIKI. One of the northern group of the Cook Islands, Pacific Ocean, belonging to New Zealand. It lies in lat. 10° S. and long. 160° W., and is a coral atoll containing a large lagoon, from which pearl shell

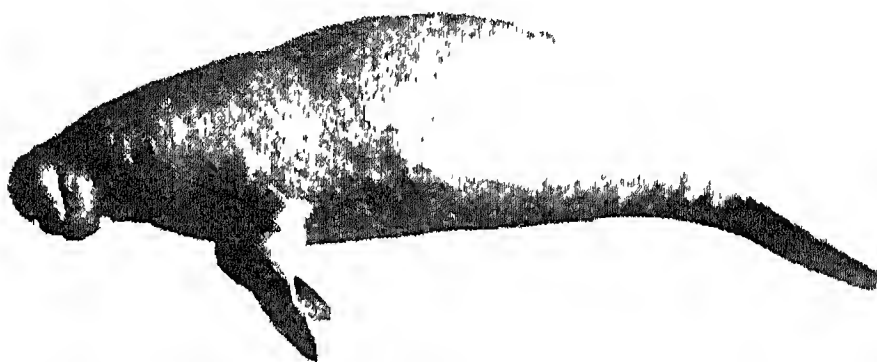


Manáos, Brazil. Theatre and monument commemorating the opening of the Amazon to international traffic in 1867

was formerly obtained. It has extensive coconut groves. Area about 30 sq. m. Pop. (1956) 897.

Man and Superman. Comedy by Bernard Shaw. First produced

at the Court Theatre, London, May 21, 1905, it was based on the Nietzschean gospel of the superman and his eternal recurrence, and tells how John Tanner, author of the *Revolutionist's Handbook* and *Pocket Companion* (which was included as an appendix to the published edition of the play), is pursued and married by Ann Whitefield, the impersonation of the life force. In the original production Granville Barker appeared as Tanner and Lillah McCarthy as Ann. The third act, showing Don Juan in Hell, was omitted but was included in the revival at the Criterion, 1911, when Robert Loraine scored a great success as Tanner. Later revivals of the abridged version included those at the Prince's, 1927 (with Gwen Ffrangcon-Davies



Manatee. Specimen of the large aquatic mammal found in the Atlantic Ocean

as Ann); Court, 1930; Old Vic, 1938. Full versions were given at the Regent, 1925 (with Esmé Percy as Tanner); Cambridge, 1935; Alvin (New York), 1947.

Manaoag. Town of Luzon, Philippine Islands. It is in the prov. of Pangasinán, 20 m. E. by N of Lingayén. In the vicinity rice, maize, sugar, and tobacco are cultivated. Pop. (est.) 22,000.

Manáos OR MANAUS. City and free river port of Brazil, capital of the state of Amazonas. It stands on the Rio Negro, 10 m. from its entry into the Amazon, and 1,000 m. from the Atlantic. It has a good harbour, and is a regular port of call for liners. The steamship journey from Para takes four days. Formerly called Barra do Rio Negro, it is a well-built town, with fine parks and public buildings. Rubber, cocoa, nuts, hides, and dried fish are exported. There is steamer connexion with Europe and the U.S.A. Pop. (1950) 89,612.

Manasarowar OR TSO-MAVANG. Lake, at 15,000 ft. alt., in the extreme W. of Tibet. With the neighbouring Mt. Kailas, it is a goal of Hindu pilgrims, and an object of veneration to Lamaism.

Manassas. Name given by the Confederates to the two battles better known as the battles of Bull Run. See American Civil War.

Manasseh. (1) Elder son of Joseph (Gen. 41), over whom his younger brother Ephraim took precedence. His descendants, a tribe which settled on both sides of the Jordan, were noted as warriors, Gideon and Jephthah being two of their most notable men.

(2) King of Judah, son and successor to Hezekiah. He reigned c. 697–642 B.C., restored idolatry, persecuted the prophets, and was carried captive to Babylon. An apocryphal Prayer of Manasses occurs in some MSS. of the Septuagint (2 Kings 21; 2 Chron. 33). Manasses is a Greek form of the name (Matt. 1, v. 10).

Manatee. Aquatic mammal of the order of Sirenians, or sea cows. It is about 8 ft. long, and in general appearance somewhat re-

sembles a very bulky and heavy seal; but there are no external hind limbs, the body ending in a broad flattened tail. The fore limbs form paddles. The head is blunt, and the great upper lip is divided. The eyes

are comparatively small; the skin is thick and wrinkled; and the body is covered with fine hairs. Manatees live in fresh water and along the coasts of S. America and Africa, feeding on aquatic vegetation.

Manbhum. Former dist. of Bihar, India. In 1956 it ceased to exist, the eastern part being transferred to West Bengal to form the district of Purulia in that state. It covered 4,130 sq. m. and in 1951 had a pop. of 1,169,047. The area is the most populous in the plateau of Chota Nagpur, and owes its importance to the Jherria coalfield, opened in 1893, the most valuable coalfield in India. The coal is sent to Calcutta for use on the rlys., for bunker coal, and for export to Colombo and Singapore. The mines are worked under considerable difficulties; the output per miner is comparatively small, and the miners rarely work continuously for more than a few weeks at a time.

Manche, LA. Dept. of France, taking its name from the French name, La Manche (the sleeve), for the English Channel. Part of the old prov. of Normandy, it is bounded by the English Channel, and by the depts. of Calvados, Orne, Mayenne and Ille-et-Vilaine. It includes the Cotentin peninsula and its long coast-line alternates

between rugged cliffs and long dunes. The cape of La Hague forms its N. extremity. Cherbourg, with its great naval base, is the chief port, Granville a fishing centre, and there are several bathing resorts. The surface is generally hilly, watered by numerous small streams, and affords good pasturage, especially for sheep and cattle. The country is well wooded in parts, and large quantities of apples and pears are grown; cider and some perry are manufactured. Textiles, granite quarries, shipbuilding,

salt, ironware, and bleaching are representative industries. The capital is St. Lô, chief town also of one of the four arrondissements of Cherbourg, Coutances, Avranches, and St. Lô. Area, 2,475 sq. m. Pop. (1954) 446,860.

During the Second Great War the dept. of Manche was the scene of the Allied landing of June 6, 1944, and of the heaviest fighting in France. Many of its towns and villages, including St. Lô, were very severely damaged, some being destroyed.

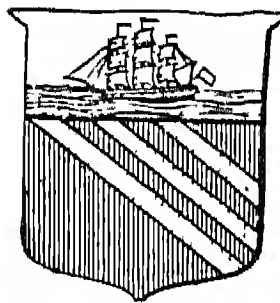
town hall tower, 280 ft. high, has a carillon of 23 bells. Beyond the town hall extension is the central library, which has a theatre, and resident municipal repertory company. The city art gallery in Mosley Street, designed by Sir Charles Barry, was opened as the headquarters of the Royal Manchester institution in 1829 and presented to the corporation in 1882. Most of the present collection belongs to the English school, but there are also early Italian, Flemish, and Dutch pictures and a group of French paintings, as well as collections of sculpture, furniture, silver, glass, ceramics, and cloisonné enamels. There are five branch galleries, including the collection of English costume (the largest in the world) at Platt Hall, and the collection of 18th-century furniture, dolls, and dolls' houses at Heaton Hall. The Portico library, also in Mosley Street, founded in 1803 as a social and literary institution, was until the Public Libraries Act of 1850, the chief circulating library in Manchester.

The Royal Exchange has occupied its site in Cross Street since 1809. Before that date business was conducted in an exchange built in the Market Place in 1729

MANCHESTER: ITS MANIFOLD INTERESTS

This article is followed by others on certain aspects of life in Manchester: e.g. Manchester Guardian; Manchester School; Manchester Ship Canal, etc. See also Cotton; Lancashire; and biographies of Bright; Cobden; C. P. Scott; and others associated with the city

Manchester is a city, a county borough, and an inland port of Lancashire, England, ranking as the second city in Britain in



Manchester arms

terms of population within equivalent radii (5 miles, 1½ million; 10 miles, 2½ millions; 20 miles, 4 millions) and as the fourth city in the country in terms of population (703,082 at the 1951 census) within the city boundary. It lies on a plain, rising to the N. of the river Irwell (a tributary of the river Mersey), 187 m. N.W. of London, 31 m. E. of Liverpool. It covers an area of 43 sq. m., and its climate is mild and humid.

It is the largest commercial city in the U.K., and is closely associated with the Lancashire cotton textile industry, for which it is the clearing house and business centre, as well as for the vast industrial concentration of S.E. Lancashire. The manufacture of textiles is no longer significant in the area, less than 10 p.c. of the employed population being so engaged. Manchester is one of the world's largest engineering centres as well as being noted for the manufacture of chemicals, foodstuffs, plastics, clothing, rainproof goods, radio and electrical equipment, agricultural machinery, electronic computers, aircraft and atomic equipment, and petroleum and rubber products.

The cooperative movement began in Rochdale, a few miles from the city, but was developed in Manchester, where the Co-operative Wholesale society has its headquarters.

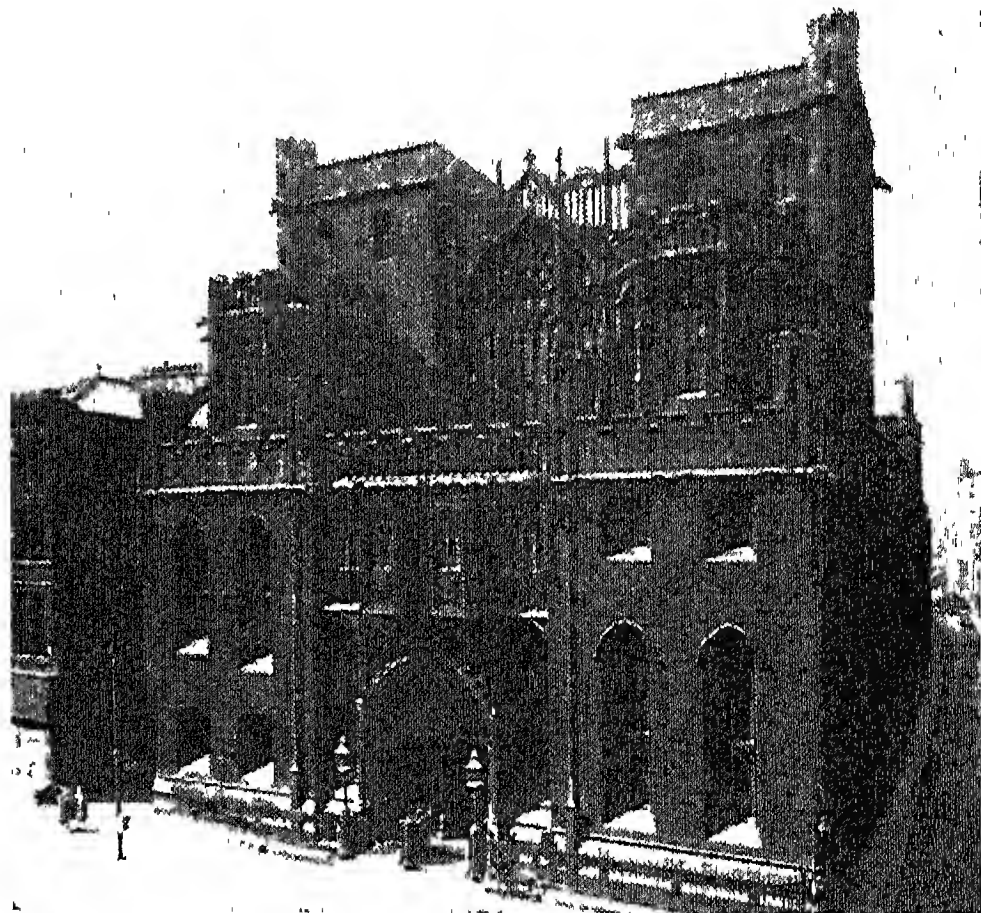
Manchester is second only to London as a press centre. The

local morning paper is the world-famous Manchester Guardian; also published in the city are two evening papers (the Evening Chronicle and the Manchester Evening News), three weeklies, seven Sunday papers, and the northern editions of six national dailies. Manchester is the north regional headquarters of the B.B.C. which established in the city its first television studio outside London; commercial television also has studios in Manchester.

The city's commercial importance is indicated by the twenty foreign consulates established there, and by the regional headquarters of nineteen government departments. Of eleven clearing bankers in England, only three have their head offices outside London—and two of these are in Manchester.

It is the centre of a network of road and railway traffic routes from all parts of the country, as well as being, through the Manchester Ship canal, the third seaport in terms of tonnage handled annually (approx. 18½ million). Manchester owns at Ringway the second most important airport in Great Britain.

The town hall in Albert Square is a Gothic building opened in 1877, adjoining is a seven-storey extension opened in 1938. The



Manchester. The John Rylands library, Deansgate. It contains 500,000 printed books and 16,000 MSS.

and later in a room over St. Ann's Passage in King Street. This second building still bears the title "Old Exchange." In 1851 Queen Victoria visited Manchester, and only the Exchange could offer a room adequate for her reception. Shortly afterwards the Exchange received the prefix "royal."

St. Ann's church in St. Ann's Square is attributed by some to

Wren, and was consecrated in 1712. Most of its cost was paid by Lady Anne Bland, a leader of fashion in Manchester and a Whig of Low Church upbringing. The Old Wellington Inn in Market Place dates from 1328 and is believed to be the oldest building in Manchester.

The cathedral is a 15th-century building surrounded by nine chapels added during the 15th and 16th centuries which make it the widest cathedral in Great Britain. The tower was built to replace the original one in 1864. Worthy of notice are the restored 15th-century nave roof, the rood screen, the 19th-century iron screens in the chancel, and a monument to Humphrey Chetham.

Chetham's Hospital and Library in Fennel Street, near the cathedral, originally the manor house in Manchester, were given by Thomas de la Warr in 1421 to the newly collegiate parish church as a college for the warden and fellows. After dissolution in 1547, and later re-endowment and dissolution again, the building remained until Humphrey Chetham founded a hospital or college in 1653 (which became a boys' grammar school) and endowed a library—the first free public library in Europe, still in its original

rooms. The John Rylands Library, designed by Basil Champneys and completed in 1900, is a fine specimen of Victorian Gothic architecture, and is one of the great scholars' libraries of the world, with 500,000 printed books, 250,000 deeds, and 16,000 historic manuscripts. Among its treasures are the famous Spencer Althorp collection, and the celebrated collection of MSS. belonging to the earls of Crawford. A feature of the library is the collection of books printed before 1500, including the famous blockprint "Saint Christopher," dated 1423, the only known copy of the earliest dated piece of European printing. The Oriental section contains more than 2,000 Arabic, Persian, and other eastern manuscripts.

Liverpool Road Station, the oldest existing railway station in the world, was built in 1830 as the Manchester terminus of the Liverpool-Manchester railway.

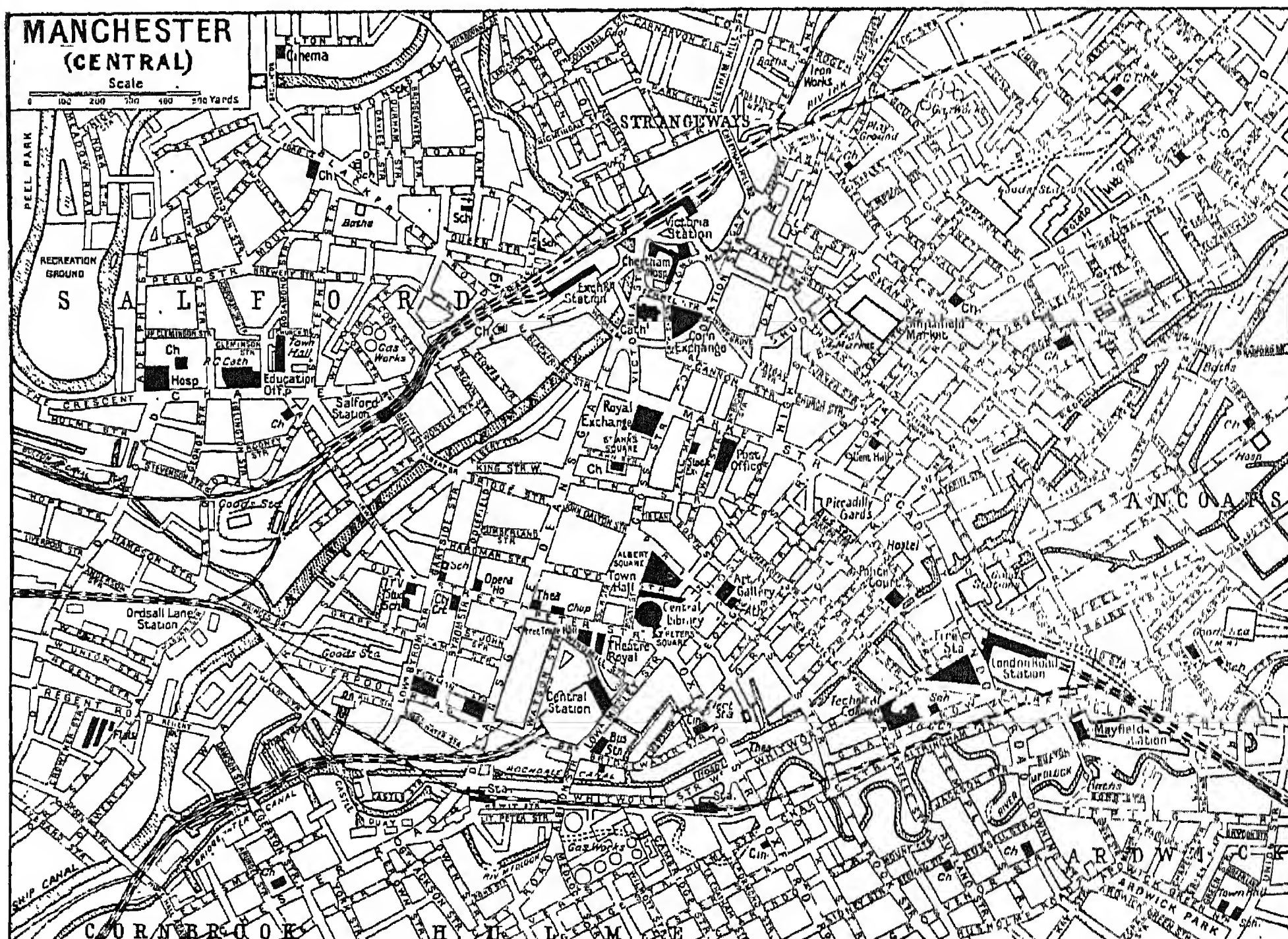
The Free Trade Hall in Peter Street is probably the most famous of Manchester buildings. Most great musicians, orchestras, and orators have appeared here, where the Hallé Orchestra gives most of its Manchester concerts. Apart from the front façade and side wall from the third hall, the building is the fourth in line of

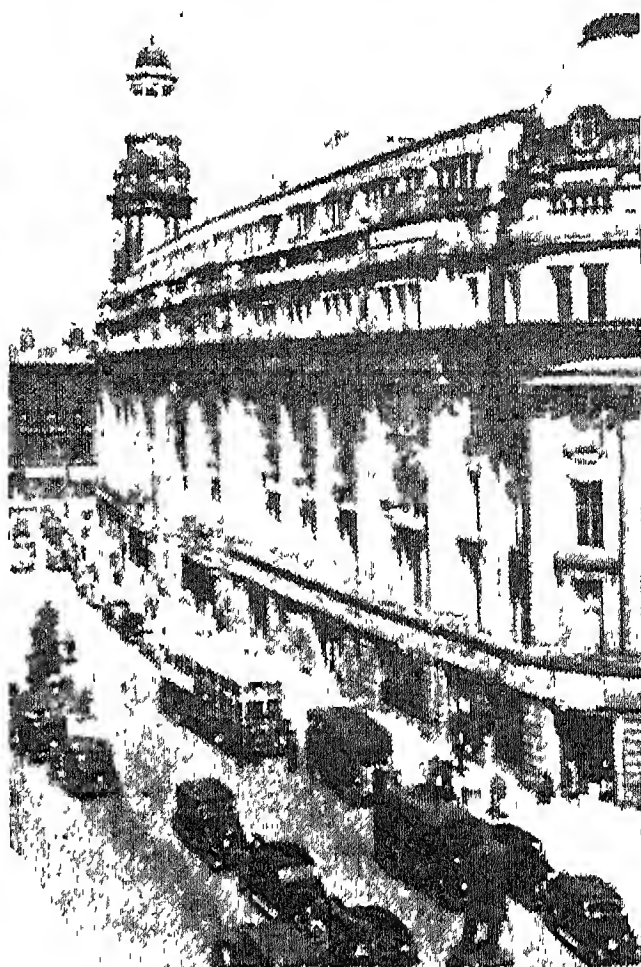
succession. The first hall was built in 1840 as a meeting place for supporters of the Anti-Corn Law League. The fourth building, opened in 1951, replaced one which had stood for 97 years until destroyed in an air raid in 1940. Other notable buildings are the Opera House (Sir Albert Richardson); Wyatt's Heaton Hall, the Georgian Platt Hall, and the Elizabethan Wythenshawe Hall, all three municipal art galleries.

Four names prominent in the history of Manchester education are: Hugh Oldham, who in 1515 founded Manchester Grammar School, the largest public school in the country; Humphrey Chetham under whose will Chetham "Hospital" (bluecoat school) and library were established in 1656; John Owens, who in 1846 founded Owens College, later merged with Manchester University; and William Hulme, founder of the Hulme charity and the William Hulme's grammar school.

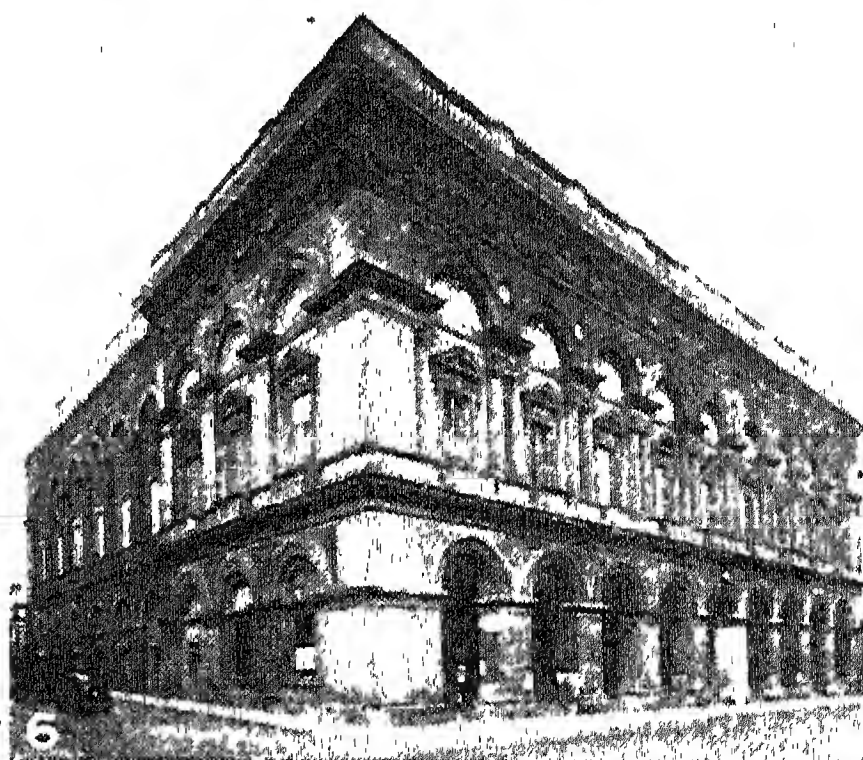
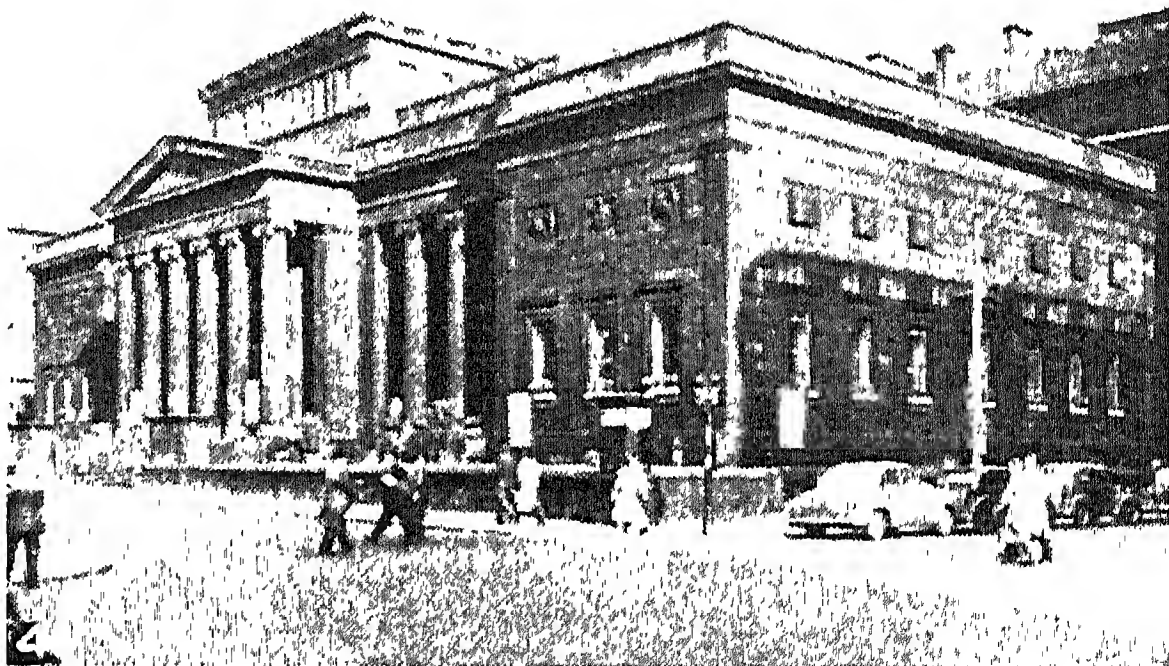
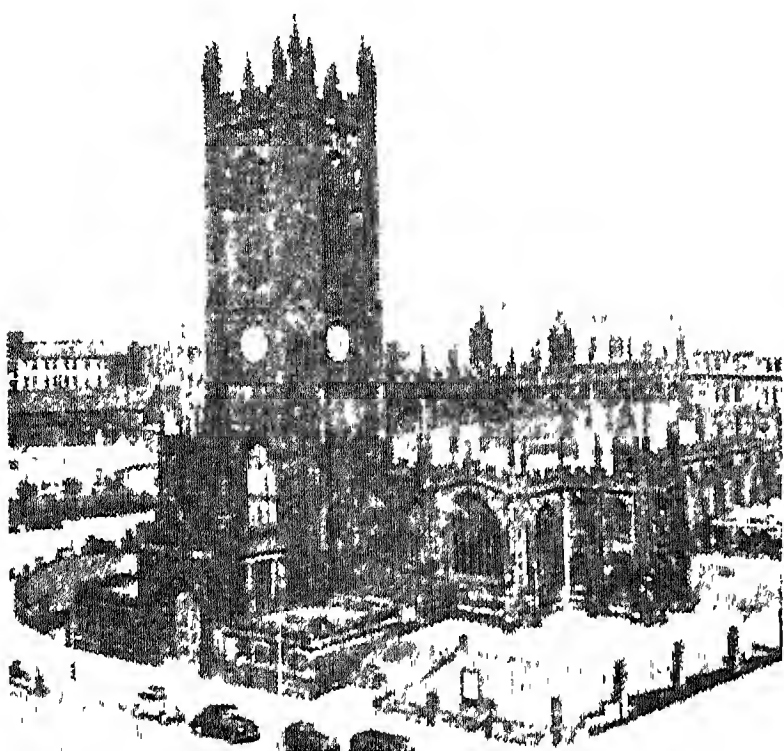
Manchester University (*see separate entry*) is the largest provincial university of England.

The College of Science and Technology has close ties with the University, 1,200 students taking post graduate and research degree courses. There are 300





Manchester. 1. Piccadilly, from the Queen's Hotel. 2. Royal Exchange and air terminal. 3. The cathedral, which dates from 15th century. 4. Art Gallery. 5. St. Peter's Square with war memorial and, left central library. 6. Free Trade Hall



other wholtime and about 5,200 part-time students, housed in the original building and in an extension completed in 1957.

Free secondary education was available in Manchester 20 years before it became obligatory, but had to be suspended by government order. The local education authority administered eight municipal grammar schools before the

Education Act of 1944 was brought into force.

The Royal Manchester College of Music, founded in 1893, supplies many of the players to the Hallé and the B.B.C. Northern Orchestras. It has about 300 students and works in close conjunction with the University. The Regional College of Art has 420 full-time students, 360 part-time, and about

600 evening students. There are more than 100 organizations in the city catering for art, antiquarian, literary, geographical, musical, photographic, and other interests. At Manchester John Dalton first propounded his table of atomic weights. Ernest (later Lord) Rutherford did some of his earlier work on atomic structure while professor of physics

during 1907-19 at Manchester University, where he first artificially split the atom.

Belle Vue, Manchester's privately owned zoo, stadium, and pleasure gardens, is the scene not only of prize fights and speedway racing, but also of great exhibitions and brass band contests. The amusement gardens and three of the ballrooms at Belle Vue were badly damaged by fire Jan. 16-17, 1958. Two leading association football clubs are connected with the city—Manchester United and Manchester City. The Lancashire county cricket ground, Old Trafford, has been the scene of many international matches.

The Gaiety Theatre, later to become a cinema, did much to pioneer repertory and the little theatre movement under the management, 1908-21, of Miss Horni-

man. Manchester has a high reputation in music. The Hallé Orchestra, founded in 1858, has international repute and receives a municipal grant of guarantee. The British Broadcasting Corporation's Northern Symphony Orchestra is based on Manchester and gives weekly promenade concerts in the town hall. The city has two chamber concert societies, while the mid-day concerts were the first of their kind in the U.K.

Two factors which have greatly influenced the cultural life of Manchester are the many citizens of foreign extraction who have settled in Manchester and enriched its culture; and the Manchester Guardian, the policy of which under the editorship, 1872-1929, of C. P. Scott, made it one of the great intellectual and social forces of the 19th and 20th centuries.

Municipally, Manchester is a county borough with a city council consisting of 114 councillors and 38 aldermen, from whom the lord mayor is selected annually for one year. The city council is responsible for the water supply to Manchester and other authorities along the route of the pipelines from Thirlmere and Haweswater in the Lake District and from Longden-dale in the Pennines. By an act of 1930 the Wythenshawe area was developed as a new town designed to embrace three industrial areas and house a population of 95,000. Steps to clear the older areas of the city of slums remaining from the era of the Industrial Revolution, included the building of more than 50,000 new houses.

Manchester corporation was a pioneer in the reduction of smoke pollution. Under the redistribution



of 1948, Manchester (formerly returning 10 M.P.s) was made into nine borough constituencies.

HISTORY. Originally a Roman fort, Mancunium, Manchester was settled by English and Danes, but had no continuous history until it became a Norman fief. By 1530 it was the most populous town in Lancashire, weaving having been introduced in the 13th-14th century. The Bridgewater canal (q.v.), 1772, and the Manchester-Liverpool railway, 1830, helped its great 19th-century development.

Manchester has always been politically conscious. In 1819 an assembly of over 50,000 people met at St. Peter's Field to agitate for much needed reforms. In a panic, although there had been neither riot nor serious disorder, the crowd was charged by yeomanry with drawn swords, and many people were killed and injured. Parliament commended the authorities at the time, but history has emphatically reversed that verdict. St. Peter's Field, afterwards popularly called Peterloo, on which the Free Trade Hall was built, became a symbol of execration to workers of the world, and inspired one of Shelley's most passionate outbursts. The agitation for the repeal of the corn laws centred in Manchester, and the city was the citadel of the free trade movement. During one of the dark periods of the American Civil War a Manchester citizens' meeting sent a letter to President Abraham Lincoln urging him to continue to fight against slavery, despite unemployment and privation due to the failure of the cotton supply.

Bibliography. Annals of Manchester, W. E. A. Anon, 1886; Mediaeval Manchester and the Beginnings of Lancashire, J. Tait, 1904; Manchester Streets and Manchester Men, T. Swindells, 1908; Manchester Merchants and Foreign Trade, A. Redford, 1934 and 1956; History of Local Government in Manchester, A. Redford and J. Russell, 1940; Stories of Manchester, C. Stewart, 1956.

Manchester. City of New Hampshire, U.S.A. It is one of the co. seats of Hillsboro co. The largest city in the state, it stands at the junction of the Piscataquog and Merrimac rivers, 18 m. S.E. of Concord by rly., and 55 m. N.W. of Boston. It has an airport. The Amoskeag falls of 55 ft. in the Merrimac provide power. It is an important cotton centre, owing this position largely to Samuel Blodgett who, after visiting Manchester, England, prophesied that the New Hampshire city

would become "the Manchester of New England." Settled in 1722 and incorporated as Derryfield in 1751, it was renamed Manchester in 1810 and became a city in 1846. The first cotton mills were established here in 1805 and flourished for over 100 years; but after the trade depression of 1929 they were closed down, being later restarted with the help of funds raised by the citizens. Among the outstanding buildings are the Carpenter memorial library, the Currier gallery of art, and the R.C. cathedral. Pop. (1950) 82,732.

Manchester. Town of Connecticut, U.S.A., in Hartford co. Situated 8 m. E. of Hartford, it is served by the New York, New Haven, and Hartford rly. The township, which has a special legislative charter, includes South Manchester. It is the centre of a region which produces tobacco, vegetables, and fruits. Known as the "Silk City," it is the site of the first silk mills in the U.S., which were established by the Cheney brothers about 1836 and are the only ones which include all the processes required to convert raw silk into finished articles. The city's other dominant manufactures are woollens, paper, rayon, velvet, fibre board, soap, electrical instruments, machinery, tools, chimes, leather goods, and toys. A state trades school is here. Settled in 1672, it formed part of Hartford and later of East Hartford and became a separate municipality in 1823. Pop. (1950) 34,118.

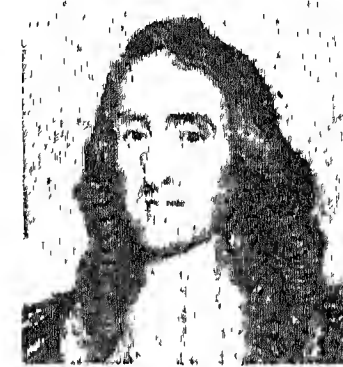
Manchester, DUKE OF. British title borne since 1719 by the family of Montagu. It derives not from the Lancashire city, but from Godmanchester in Huntingdonshire. Sir Henry Montagu (1563-1642), a noted judge in the time of James I, became lord treasurer and lord privy seal, being made a baron in 1620 and earl of Manchester in 1626. His grandson Charles, the 4th earl, a stout supporter of William of Orange, became English ambassador in Venice, Paris, and Vienna, and was created duke of Manchester in 1719.

William, the 5th duke (1768-1843), was postmaster-general in the Tory cabinet of 1827-30, and governor-general of Jamaica. William, the 7th duke, married Louise, countess von Alten, afterwards wife of the 8th duke of Devonshire and a famous society figure. William Angus Drogo, the 9th duke, succeeded to the title at the age of 15, when he was

still at Eton. He was captain of the Yeomen of the Guard, 1906. In 1932 he published *My Candid Recollections*. He died Feb. 9, 1947, and was succeeded by his son, Alexander George Francis Drogo Montagu (b. Oct. 2, 1902) as 10th duke.

The duke's seats are Kimbolton castle, Huntingdon, and Tandragee castle, co. Armagh. The eldest son bears the courtesy title of Viscount Mandeville.

Manchester, EDWARD MONTAGU, 2ND EARL OF (1602-71). English parliamentary leader in the Civil War.



2nd Earl of Manchester, English parliamentarian

The eldest son of the first earl, and educated at Sidney Sussex College, Cambridge, he represented Huntingdon in parliament 1623-26. In 1626 he was

raised to the peerage as Baron Montagu, though generally known by the courtesy title of Viscount Mandeville. He sided with the Puritans in the quarrel with the king, and became one of the chief leaders of the popular party among the lords. His name was added to those of the five members who were impeached for treason by Charles I in 1642.

In the same year he succeeded his father as earl of Manchester and became a leader in the parliamentary army. He thought, however, that peace could better be re-established by negotiation than by fighting. He was nominally in command at Marston Moor, and won the second battle of Newbury, but quarrelled with Cromwell, and was deprived of his command by the self-denying ordinance. He opposed the trial and execution of the king, and retired when the Commonwealth was established. He took part in bringing about the Restoration, and was in 1661 made K.G. He died May 5, 1671.

Manchester and Liverpool District Bank. Oldest joint stock bank in England. It was established in 1829, chiefly through the efforts of a man named Joseph Macardy, who had conceived the plan of extending a bank's sphere of influence by means of a network of branches. With the idea of expansion as one of its *raison d'être* the bank has had a long series of amalgamations and mergers to record. One

of the most interesting of its satellites is the Lloyd Entwistle, Bury, and Jervis Company. The history of this firm can be traced back to 1771 and it was acquired by the District Bank in 1863. Another interesting association is that with the Saddleworth Banking Company which, through its connection with Buckley & Co., has local history going back well into the 16th century.

In 1924 the Bank dropped its more cumbersome title and adopted the simplified form of District Bank Ltd. Eleven years later the most important amalgamation to date took place, that with the County Bank. This merger placed the District among the seven largest banks in the country and brought its total number of branches up to nearly 600. In 1870 the Bank was incorporated under the Companies Act and received from the Heralds' College a grant of arms. The shield copies that of the borough of Manchester, but it is silver instead of red, and has two bendlets gules instead of three golden ones. The crest is a ship, which may be taken as the emblem of commerce, while the motto is *Decus Prudentiae Merces*. "Honour, Wisdom's Meed." The Bank's total assets exceed £225,000,000, the authorised capital is £10,560,428.

Manchester College. A residential theological college in Oxford. It was founded in 1786 in Manchester, one of a succession of academies, the earliest being that opened by Richard Frankland at Rathmell in 1670. Its chief purpose was to give a training for the ministry of religion among dissenters. After being located in York and again in Manchester it was transferred to London in 1853, and from there in 1889 to Oxford. In 1893 the present fine buildings were erected in Mansfield Road. It is open to students of any denomination, without doctrinal tests, but its main support and constituency have been Unitarian. Among its past principals were James Martineau, James Drummond, J. Estlin Carpenter, and L. P. Jacks. Scholarships may be awarded for research in religion, theology, or ethics. Generous exhibitions are granted to external students for their undergraduate course prior to entering the college and to internal students for the ministry.

Manchester Guardian, THE. English daily newspaper. Founded May 5, 1821, by John Edward

Taylor (1791-1844) as a four-page weekly at 7d., it began daily publication at 2d. on July 2, 1855, and was issued at 1d. from Oct. 5, 1857, until the First Great War. It was edited by its founder, 1821-44; by his eldest son, R. S. Taylor, 1844-48; by J. Garnett, 1848-61; by J. E. Taylor, 1861-71; by Charles Prestwich Scott (*q.v.*), a nephew by marriage of the founder, 1872-1929; by E. T. Scott, 1929-1932; and members of the Scott family continued to be associated with the paper. A London office was opened 1868, and a weekly edition in July, 1919.

The Manchester Guardian is one of the most influential papers in the kingdom, notable for the standard of its criticism, its independence, its foreign service, and the fullness and value of its general news and commercial intelligence. Among eminent contributors to it may be mentioned C. E. Montague, Allan Monkhouse, Neville Cardus, Howard Spring, Ivor Brown, James Bone, and the cartoonist David Low.

Consult The Manchester Guardian: A Century of History, W. H. Mills, 1921; C. P. Scott, 1846-1932; Making of the Manchester Guardian, various hands, 1947.

Manchester Players. British theatrical company. Miss A. E. F. Horniman, who had already launched the Irish Players on their career in the Abbey Theatre, Dublin, began a similar enterprise with the Manchester Players at the Midland Theatre, Manchester, in Sept., 1907. In the spring of 1908 she bought the Gaiety Theatre, Manchester, and within two years built up a repertory of the very first rank.

Among its most noteworthy productions were John Galsworthy's *Strife*, *Justice*, and *The Silver Box*; *The Voysey Inheritance*, by Granville Barker; *Hindle Wakes*, by Stanley Houghton, a comedy of Lancashire life; and plays by Charles McEvoy, Harold Brighouse, St. John Hankin, and Bernard Shaw. Among notable members of the company may be mentioned Sybil Thorne-dike and (Sir) Lewis Casson; the latter was director of the theatre 1911-14. In 1920 Miss Horniman sold the Gaiety Theatre, Manchester, owing to lack of support for her movement, and the company was disbanded. See Horniman, A. E. F.; Repertory Theatre.

Manchester Regiment. Past regt. of the British army. It was formed in 1881 by amalgamating the 63rd and 96th Foot and two

battalions of the Royal Lancashire Militia; the 63rd becoming the 1st and the 96th the 2nd battalion of the new regiment. The 63rd had been formed in 1758 from the 2nd battalion of the 8th Foot, now the King's Regiment, which was raised in 1685. The 63rd Foot first saw active service at Guadeloupe in the West Indies, and after fighting in Flanders again went to the West Indies where it gained the honours Martinique, 1794, and St. Lucia, 1796. In the Crimea the regiment was at the battles of Alma and Inkerman, and the siege of Sevastopol, and it served in the Afghan campaign of 1879-80.

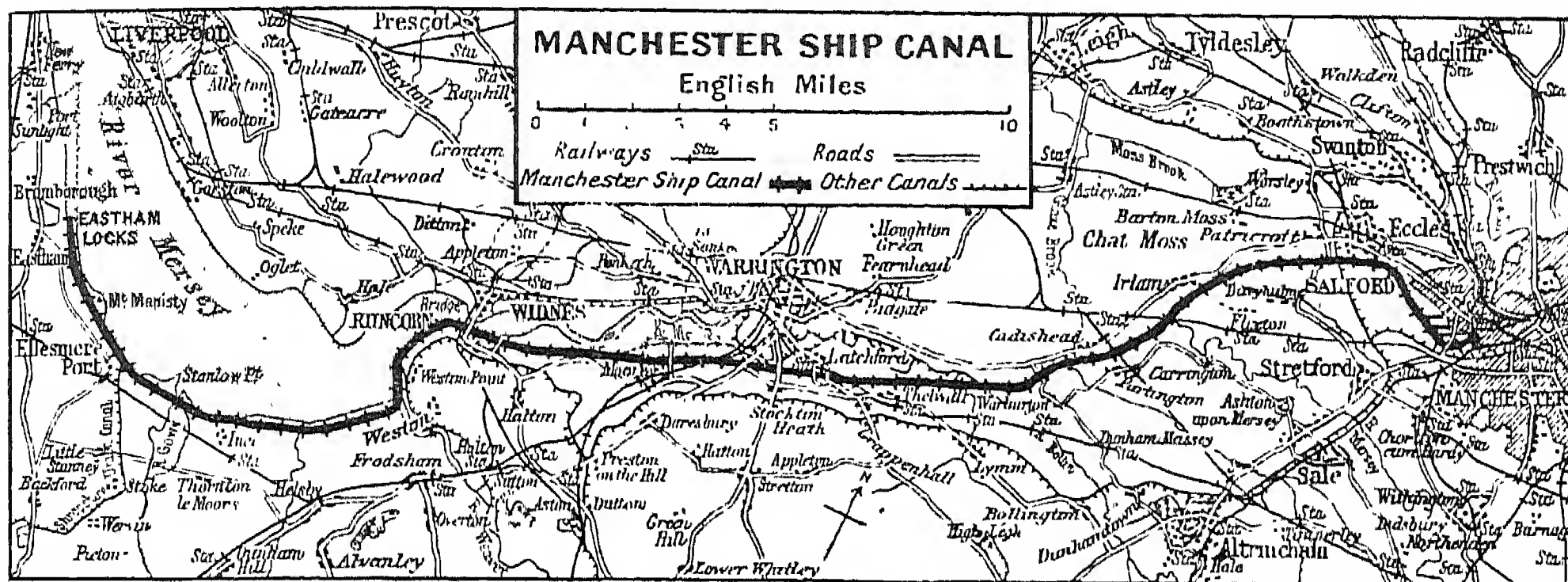
The 96th Foot had been raised for service in the Napoleonic wars and was with Abercromby in Egypt in 1801 and later fought under Wellington in the Peninsular campaign. Disbanded in 1818, the 96th Foot was reformed in 1824 and fought throughout the New Zealand War of 1846-47. The regiment's first campaign was in the S. African War, in which it played a prominent part at Elandslaagte and Ladysmith.

Forty-two battalions of the Manchester Regiment were raised in the First Great War and gained the honours: Mons; Givenchy 1914; Ypres, 1915, '17, '18; Somme, 1916, '18; Hindenburg Line; Piave; Macedonia, 1915, '18; Gallipoli, 1915; Megiddo; and Bagdad.

Of the five service battalions that fought in the Second Great War, the 1st was captured at Singapore, the 2nd served in Burma, the 8th in Malta, and the 9th in Italy. In 1957 the Manchester Regiment was amalgamated with the King's Regiment (Liverpool) as part of the Lancastrian Brigade.

Manchester School. Name given in the 19th century to a group of politicians and economists and the ideas associated with them. Their leaders were Cobden, Bright, and Milner Gibson, and their headquarters were in Manchester, where the Anti-Corn Law League was founded in 1838. Founding their principles on utilitarianism, they believed in non-interference in industry by the state, in free trade, and peace. The period during which the ideas of the school were dominant is generally regarded as 1845-75. See Free Trade; Utilitarianism.

Manchester Ship Canal. Canal connecting Eastham on the Mersey with Manchester. The long-contemplated project for making Manchester an inland seaport began to



Manchester Ship Canal. Map showing the course of the canal from Eastham, on the Cheshire side of the Mersey, to Manchester, which affords sea-going vessels of large tonnage access to the city

take practical shape in 1882, when Daniel Adamson, ironfounder, called a meeting of the mayors of Lancashire manufacturing towns to consider the construction of a tidal waterway between Liverpool and Manchester.

His enterprise and enthusiasm led to the undertaking of the work, and in spite of many initial difficulties the construction, begun in 1887, was completed Dec. 16, 1893, and the Manchester Ship Canal was formally inaugurated by Queen Victoria, May 21, 1894. Traffic had begun in Jan. The canal is 35½ m. long. The original contract was £9,000,000, but extra costs brought the capital expenditure to over £19 millions.

The ship canal has had an enormous influence upon the commercial importance and development of Manchester, which in 1958 ranks in tonnage as the third port in the U.K. It has the most adequate dock accommodation, appliances, and equipment; with an elaborate system of transit sheds, the handling of cargo is expeditious; regular lines of steamers enable exporters to ship direct to the principal foreign ports, and the Bridgewater department deals with the traffic between the docks and inland towns of the Midlands. The tonnage figures, which were 925,659 tons in 1894, were by the mid-20th century approx. 18½ million tons annually.

The entrance to the ship canal is at Eastham, 19 m. from the bar at the mouth of the river Mersey, and the access is from the sea by way of the lower estuary. The canal skirts the shore of the estuary up to Runcorn, terminating at Trafford Bridge in Manchester. It is divided into four reaches, and the passage is about seven hours, allowing about half an hour for locks. The Customs port

begins at the E. termination of the Port of Liverpool, and includes the rivers Mersey, Irwell, and Weaver, and the canal from Eastham to Hunt's Bank.

The depth of the canal is 28-30 ft., maintained by dredging, and the bottom width is 120 ft. (except near Latchford, 90 ft.). The Queen Elizabeth II oil dock near the Mersey entrance to the canal at Eastham was opened in 1954 and can berth four 30,000-ton tankers. At Manchester are three graving docks and a pontoon dry dock, and a second pontoon dry dock is at Ellesmere Port. Twin-screw steamers of 12,500 tons navigate the canal. The dock estate covers 206½ acres, water space 120 acres, and the quay and storage area is 286½ acres. Adjoining on the S. side is the huge Trafford Park estate, 1,183 acres, with 3 m. of frontage to the ship canal and 3½ m. to the Bridgewater Canal; here are located some 125 firms engaged in engineering and other industries. The cold storage department, with a capacity of 1,000,000 cu. ft., holds 10,000 tons of perishable foods. See Aqueduct; Bridgewater Canal; consult History of the Manchester Ship Canal, B. Leech, 1907.

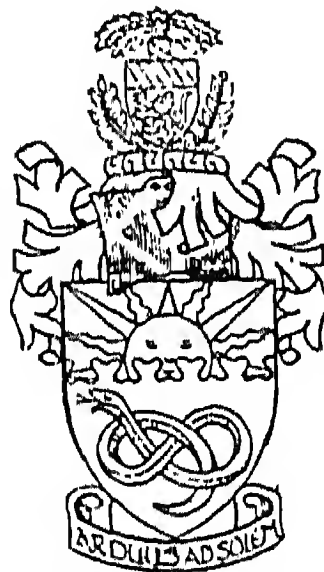
Manchester Square. London square. It lies between Baker Street and Thayer Street, Marylebone, W., and, built during 1770-88, was named after the 4th duke of Manchester, who here built Hertford House (*q.v.*), home of the Wallace Collection.

Manchester Terrier. See under Terrier.

Manchester University. Educational establishment in England, in full the Victoria University of Manchester. In 1851, through the munificence of John Owens, a Manchester merchant, a college was opened in the city

for higher education. In 1880 this became one of the colleges of Victoria University, founded in that year; but in 1903 the University, which included colleges at Liverpool and Leeds, was dissolved, and Manchester obtained a separate University. In 1872 the school of medicine had been united with Owens College.

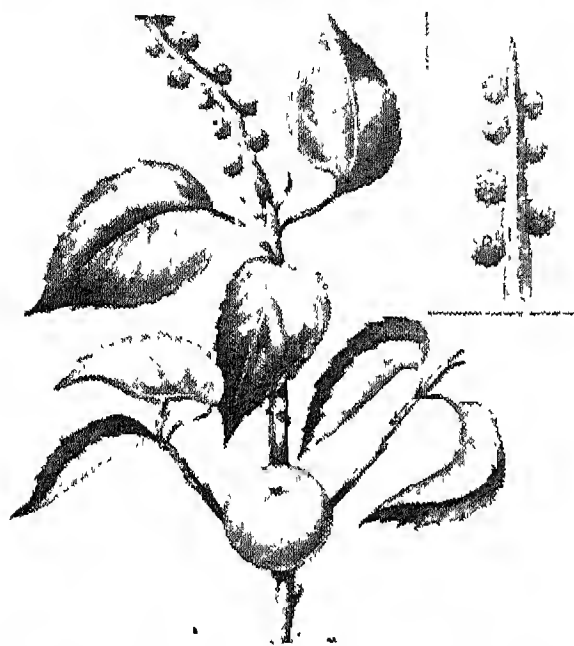
The University has faculties and departments for every kind of study. Normal degree courses, open to men and women, are three years. In arts a high standard is maintained, while great attention is paid to science, medicine, and technology, as well as to such subjects as commerce and administration. The municipal college of tech-



Manchester University arms

nology, associated with the University from 1905, in 1956 became the Manchester College of Science and Technology. The University buildings include the original Owens College and subsequent additions, as well as the Manchester museum, with the Flinders Petrie Egyptology collection. The libraries have over 700,000 vols. An arts library was opened in 1936. There are laboratories for study and research in electro-technics, radio-astronomy, etc. In 1957 there were over 6,200 students and a teaching staff of 975. The main buildings cover a site 1 m. from the city centre. See Gown col. plate.

Manchineel (*Hippomane mancinella*). Tree of the family Euphorbiaceae. A native of Central



Manchineel. Spray with flower, foliage, and fruit. Inset, flower head

America and the W. Indies, it has shining egg-shaped leaves with toothed edges, small inconspicuous flowers, and yellowish-green fleshy berries. It abounds in milk-like and intensely poisonous sap. A single drop of the juice in contact with the eyes will cause blindness for days. Smoke from its wood when burnt has a similar effect.

Manchu. People of pure Tungus stock in E. Asia. Tall, slender, level-eyed, medium-headed, they betray contact with the prehistoric Caucasoid migrations. Originally pastoral nomads in the Sungari basin, they are now peaceably settled husbandmen, professing Lamaism and forming only a very small part of the population of Manchuria. Their Altaic speech is

written in a modified Aramean script resembling Mongolic. The Ch'ing dynasty which they imposed upon China lasted from 1644 until the revolution of 1911-12.

Manchukuo. Former puppet state of Asia. Proclaimed an independent state by Japan in 1932, it comprised the then three provs. of Manchuria—Fengtien (or Liaoning), Kirin, and Heilungkiang—together with Jehol prov. Area 503,000 sq. m. The capital was Changchun (Hsinking), and the Japanese made Henry Pu Yi (the former Emperor Hsuang Tung of China) head of the new state (see Pu Yi). With the defeat of Japan in 1945, Manchukuo ceased to exist.

Manchuria. Name for an area of north-east China. Its extent, and its administrative divisions, have varied from time to time. Before the Japanese invasion of 1931, it was divided into the three provs. of Fengtien (or Liaoning), Kirin, and Heilungkiang, total area 428,700 sq. m. In the reorganization of 1945 that followed the defeat of Japan, Manchuria was divided into nine provs.: Hsingan, Heilungkiang, Hokiang, Nunkiang, Sungkiang, Liaopei, Kirin, Liaoning, and Antung. The Communist govt. again re-organized the territory in 1950. Hsingan and Liaopei were made part of a re-organized Inner Mongolia. The rest of

Khingan mts. and the Changkwang-sai mts., run from S. to N., with peaks ranging from 3,000 to 8,000 ft. They are rich in timber and minerals, especially coal. The N. boundary is the Amur river and its trib. the Argun; other tribs. are the Kumara, Sungari, and Usuri. Of these the Sungari is the longest; with its tributary, the Nonni, it almost encircles the Little Khingan mts. In the S. the Tumen, Yalu, and Liao-ho drain fertile plains which form some of the richest land in E. Asia.

Manchuria extends from 39° 40' N. lat. to 53° 50' N. lat., and has a climate comparable with that of the N.E. United States and the maritime provinces of Canada. Except Dairen and Port Arthur, the ports and the rivers are frozen for about six months; the ice is generally thick enough to bear heavy traffic. The rainfall is, on the whole, slight; most of it falls in Aug., when floods on the rivers interfere with traffic. Snow falls to a depth of 1½ ft., and sledges are used over it in the towns and along the highways, which are but dirt-tracks across the countryside.

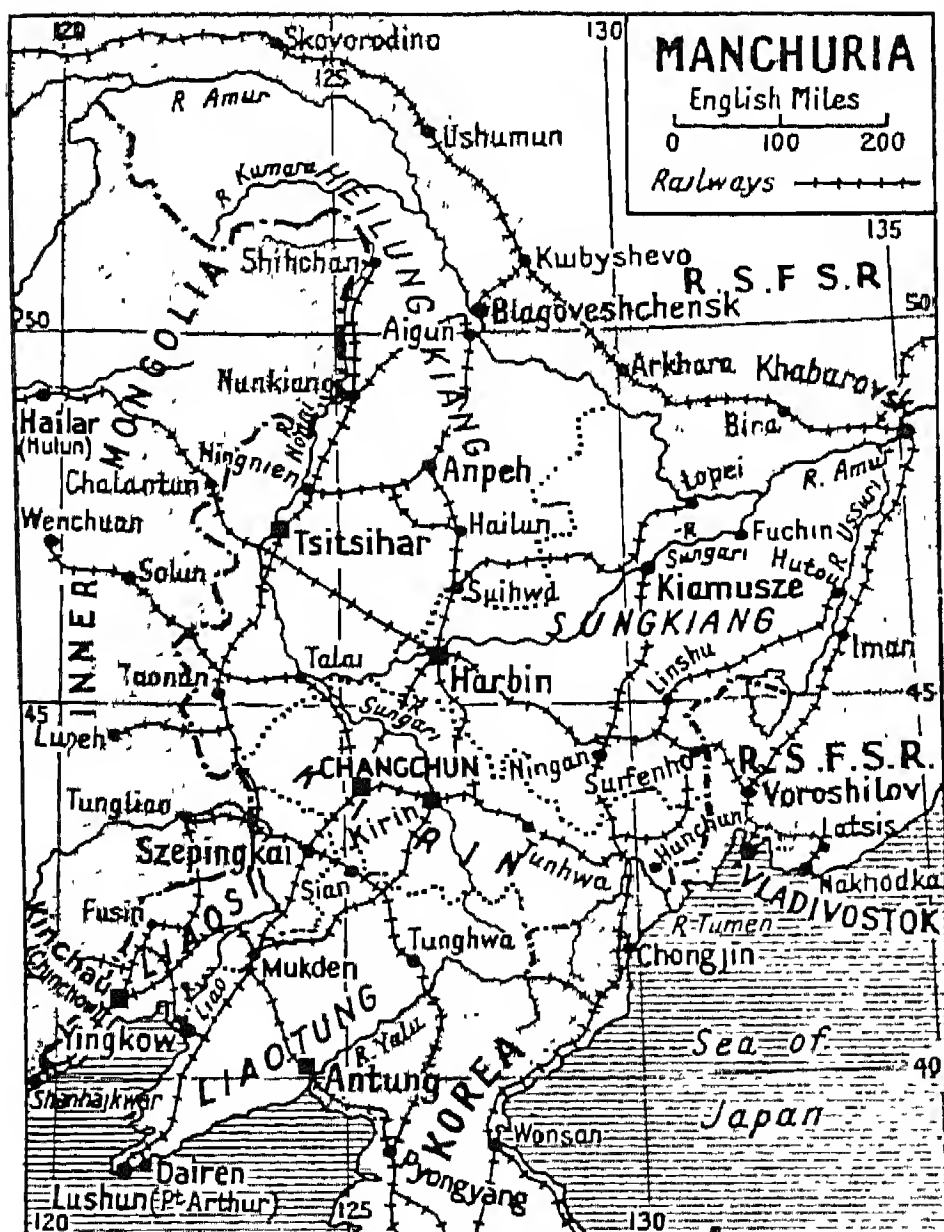
Agriculture and Industries

All the valleys are fertile and, on the whole, well cultivated; soya beans, kaoliang, millet, maize, and wheat occupy most of the arable area. Minor crops are red beans, oats, hemp, and tobacco. In the S. tussore silk is obtained from wild silkworms that live on the leaves of a species of oak; ginseng is found wild and is cultivated in Kirin. Cattle kept for milk and meat, and horses, mules, and donkeys reared as draught animals are common; sledge dogs are bred in the N.E. and camels near Mongolia.

Gold is mined in the N. and coal in the S., while silver, lead, copper, iron, and salt are also found. The extraction of bean, castor, and other oils is a valuable industry at Mukden, which also has flour milling, brewing, bricks and earthenware works.

The Chinese Changchun rly. crosses Manchuria from N.W. to S.E., connecting at both ends with the Trans-Siberian rly., and a branch runs S.W. from Harbin to Port Arthur (Lushun) and Dairen via Changchun and Mukden. Other lines link with the railways of Jehol province and of Korea.

About the beginning of the 17th century Nurhachi, a Manchu ruler, had firmly established himself in Manchuria, and in 1623 he transferred his capital to Mukden. His son conquered Korea, and the



Manchuria. Map of the most north-easterly territory of China, as reorganized by the Communist government in 1950

Manchuria ceased to be an administrative area and was divided into five provinces, namely Liaotung, Liaosi, Kirin, Heilungkiang, Sungkiang. These were reduced to three in 1955: Liaoning (Liaosi and Liaotung plus part of Jehol), Kirin, and Heilungkiang (including Sungkiang). Changchun, Mukden, Harbin, and Antung are the chief cities; Port Arthur (Lushun) and Dairen the two chief ports.

Manchuria is bounded north and east by the R.S.F.S.R., south by Korea, west by Inner Mongolia. Two mountain ranges, the

next ruler overthrew the Ming dynasty of China. There are hardly a million Manchus left in their former home, most of the present inhabitants being immigrant Chinese. This territory has been desired by foreign powers, on account of its fertility and its ice-free harbours. In 1895, by the treaty of Shimonoseki, Japan obtained part of S. Manchuria, but gave it back on the advice of the powers. Russia almost immediately obtained rly. rights and a lease of Liaotung peninsula. At the Portsmouth conference in 1905 Japan gained Liaotung and rly. concessions in S. Manchuria, confirmed in 1917.

In spite of agreements with the western powers to give up her claims on China's north-east, Japan provoked various incidents which led to open seizure of the whole of Manchuria in 1931 (and the setting up of Manchukuo (*q.v.*) in 1932). The Lytton commission, appointed by the League of Nations, denounced this action as aggression, and Japan left the League. The territory thenceforward became a base for operations against China, full-scale, though undeclared, war following an incident near Peking on July 7, 1937. In Aug., 1945, Soviet troops invaded Manchuria and engaged Japanese forces till their capitulation on Aug. 15, after which the numerous Japanese colonists were sent back to Japan. The Russians evacuated Manchuria, except Port Arthur and Dairen, by May, 1946, taking, however, much Japanese-owned industrial equipment as reparations, with the result that much of the industry Japan had developed in Manchuria was brought to a standstill.

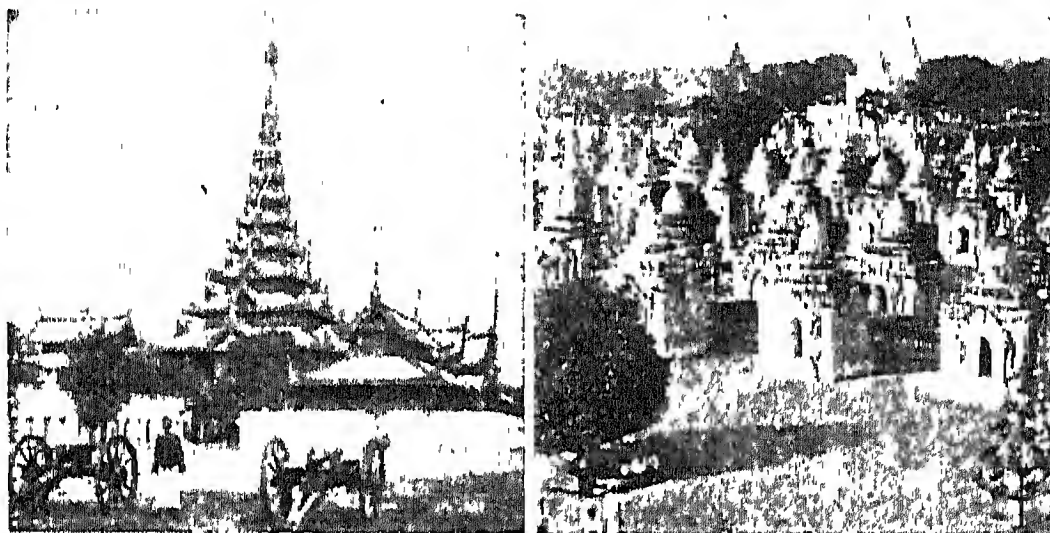
The Chinese Nationalist govt. took over the evacuated territory, but was unable to hold it against the Chinese Communists, who were in control of all Manchuria by the end of 1948, except for Port Arthur and Dairen, which remained in Russian hands.

Bibliography. *M.*, its People and Recent History, A. Hosie, 1901; *International Relations of M.*, C. W. Young, 1930; *M.*, Cradle of Conflict, O. Lattimore, 1932; *North China Front*, J. Bertram, 1939.

Mandaeans OR SUBBA. A small, fast-dwindling, non-Christian Gnostic community resident since Parthian times in Khuzistan and S. Iraq. Some still speak Aramaic;

their literature is in Mandaic, a semitic dialect resembling Babylonian Talmudic. Their script is peculiar to themselves. Older parts of their holy books (*Ginza Rabba* and *Liturgy*) may date to the 3rd century A.D. They call themselves Nasoreans, practise immersion in running water, and have sacraments for the dead. Babylonian, Jewish, and Magian traditions appear in their doctrines. *Consult* *The Mandaeans of Iraq and Iran*, E. S. Drower, 1937.

Mandalay. Division and dist. of Burma. The division comprises the upper valley of the Irawadi. The dist., in the south of the div., is



Mandalay, Burma. Left, palace of Theebaw, the last king. Right, some of the 450 pagodas forming the Kuthodaw, or temple

slightly cultivated (13 p.c. of the area), chiefly for rice; the rest is almost uncultivated. The S. dist. is part of the dry area of Central Burma, the annual rainfall being 33 ins., while that of the remainder exceeds 60 ins. and the coasts of Burma receive at least 100 ins. The Mandalay Canal, 42 m., irrigating 125 sq. m., was opened in 1902, running parallel to an old Burmese waterway. Div.: area 32,476 sq. m.; pop. 1,907,703. Dist.: area 2,117 sq. m.; pop. 408,926.

Mandalay. A city of Burma, formerly the capital of Upper Burma. A modern river port, its situation on the Irawadi 350 m. almost due N. of Rangoon destined it to be the commercial centre of inland Burma. To the S. the Sittang valley leads to Rangoon and the Gulf of Martaban; S.W. lies the Irawadi, N. the Upper Irawadi; and E. the Myitnge yield access to N. Burma. Except to the S.W. all these routes are followed by rly. lines, while a fourth line leads up the Chindwin Valley to the N.W. The city lies in the dry belt of Burma, surrounded by a broad alluvial plain. In 1860 its site was a jungle swamp.

The early town was a square, surrounded by a wall with curious wooden towers over its gates. It contained the royal palace within

a square enclosure, 370 yds. each side. The front of the palace included the great hall of audience, made of elaborately carved and gilded teak timber. Within the enclosure also stood the treasury, arsenal, mint, and the stables of the white elephant. From 1857 Mandalay was the capital of the Burmese kingdom; in 1885 it was occupied by the British who captured King Theebaw. A great fire in 1892 destroyed considerable portions of the city, and a new city was built. The old walled town is now known as Fort Dufferin; outside its walls are numerous temples, pagodas, and monasteries. Of these the most remarkable is the Kuthodaw, or temple, with its hundreds of pagodas, arranged to form a square, about 800 yds. each side. Mandalay agricultural college is part of the university of Rangoon.

In the Second Great War Mandalay, wrecked by enemy bombing, was evacuated by the British and occupied by the Japanese May 1, 1942. British troops re-entered the N. outskirts of the city March 8, 1945. By the 12th Fort Dufferin, with its massive walls, was the only serious obstacle remaining, but this the Japanese defended fanatically, and the end came only after Mitchell bombers, on the 19th, breached the wall, with 2,000-lb bombs. Next day at 12.45 the besieging troops were astonished to see an Anglo-Burman walk out of the N. gate carrying a Union Jack and a white flag. The Japanese had pulled out of the fort at noon, leaving in it only 346 refugees, including a number of missionaries. (See *Burma Campaign*.)

The 1950 est. pop. was 165,000. Kipling's famous verses, *On the Road to Mandalay*, included in his *Barrack-Room Ballads*, 1892, give the flavour of the early British period of occupation.

Mandamus (Lat., we command). Court order of a high nature, made by the queen's (king's) bench division. It is made only where there is no other remedy, and is addressed to a court, a person, or a corporation, commanding the performance of some legal duty of a public nature—*e.g.* to a court of petty session commanding it to hear and determine a case according to law, or to a municipal body, ordering the

provision of an isolation hospital. It enforces some private rights when withheld by public officers. Non-compliance is contempt of court. The procedure was simplified in 1938. See Writ.

Mandarin (ultimately from Skt. *mantrin*, counsellor). Term used under the Empire by Euro-



Mandarin of Hanyang in official robes

peans for a Chinese official, civil or military. There were nine grades, distinguished by the button on the cap, the embroidery on the robes, and the girdle-clasp. The buttons, the same for civil and military mandarins, were in order of rank

as follows: A ruby or a transparent red stone, a red coral button, a sapphire button, an opaque blue stone, a crystal button, an opaque white shell button, a plain gold button, a worked gold button, and a worked silver button. The embroidery for civil mandarins represented birds, and for military mandarins wild beasts. The Chinese spoken by officials and educated people is called mandarin (Kuan-hua). It is now known as gwoyen. The term was formerly applied to other Asiatic officials besides Chinese.

Mandarin Duck (*Dendrocygna galeata*). Bird of the duck family found in China and E. Asia. The plumage of the male is brilliant, the head bearing an erectile crest of green, white, and brown. One of the scapular feathers is developed into a large upturned fan of bright chestnut with a broad purple band, which adds much to the striking appearance of the bird. The female is soberly clad in mottled brown.

Owing to their beauty, these ducks are in favour for ornamental waters. See Duck.

Mandasor, MANDSAUR, OR MANDESUR. Town of Madhya Union, India. It lies within the former princely state of Gwalior, and is 80 m. N.W. of Ujjain by rly. It gives its name to the treaty

which in 1818 ended the Mahratta-Pindari war. Here is centred the poppy-growing industry of Malwa.

Mandate. In law, a command, charge, or commission. A consignment of goods to be carried, or to have something done to them, is sometimes called a mandate; the term derives from the Roman *mandatum*, a contract by which one person undertook to perform some service for another without payment, if guaranteed against loss. In canon law a mandate is a command by the pope to put a certain person into the first vacant benefice in the gift of the individual to whom the command is addressed. Politically, the word is used to signify a charge laid by electors upon their representatives. The Labour government of 1945 used the expression freely in support of their more far-reaching measures for the nationalisation of various industries.

Mandated Territories. Colonial territories taken by the Allies from Germany and Turkey at the end of the First Great War and administered on a trusteeship for the inhabitants under the general control of the League of Nations. The territories fell into three classes: (a) those considered merely to require assistance in administration for a time, e.g. Palestine, Syria; (b) backward territories which were to be administered on a basis that included the grant of equal opportunities for trade to other members of the League, e.g. Tanganyika; (c) those to be administered by the controlling power as parts of its own territory—e.g. S.W. Africa.

Mandates were accepted by the U.K. for Iraq, Palestine (including the later Transjordan), Tanganyika, parts of Cameroons and Togoland; by Australia for New Guinea and Nauru; by New Zealand for Samoa; by South Africa for S. W. Africa; by France for Syria, Lebanon, and parts of Africa; by Belgium for Ruanda-Urundi (German E. Africa); and by Japan for groups of islands in the Pacific.

The League mandates were by nature impermanent, and that for Iraq ceased when the country was admitted to the League in 1932. The Syrian and Lebanese mandates, though juridically still

in force, were *de facto* terminated by the treaty between France and the new republics, Dec. 27, 1943. The position concerning the Palestine-Transjordan mandate was more complicated. The U.K. recognized Transjordan as a sovereign independent state in 1946 (see Jordan), and gave up the mandate for Palestine (*q.v.*) in 1948. The remaining mandated territories (with the exception of South-West Africa, *q.v.*) became United Nations trusteeship territories in 1946.

M and B. A term in England designating drugs of the sulpha group. It comes from the initials of the firm of May and Baker, manufacturing chemists. It describes a bactericidal agent which inhibits the growth of organisms by interfering with their metabolism, and so is used in treatment of pneumonia and other diseases. Gerhard Domagk, of I. G. Farbenindustrie, discovered the principle while doing research work on aniline dyes. See Sulphonamides.

Mandel. GEORGES (1885-1944). French politician. He was born June 5, 1885, son of a Jewish draper. He contributed to *L'Aurore*, a newspaper owned by Clemenceau, and was assistant chief of cabinet in 1906 during the latter's first ministry. When Clemenceau became prime minister in 1917, Mandel was made director of the cabinet, and in 1937 was minister for the colonies under Édouard Daladier. In June, 1940, he became minister of the interior. After the 1940 armistice he fled to Morocco, but was brought back to France and handed over to the Germans, who put him into Buchenwald concentration camp. Brought back to Paris as a hostage, he was murdered July 8, 1944, while ostensibly being taken to Vichy. Two men, G. Nerioni and P. Boers, were executed for the crime on Oct. 28, 1944.



Georges Mandel, French politician

Mandelic Acid OR PHENYLGLYCOLIC ACID. Crystalline body discovered by Winckler in bitter-almond water. It is prepared by converting benzaldehyde into mandelonitrile and hydrolysis of the latter. Mandelic acid was introduced into the British Pharmacopoeia in 1941. It has been used in medicine in the treatment



Mandarin Duck. Drake of this Chinese aquatic bird
W. S. Berridge, F.Z.S.

of urinary infections, especially in the form of its ammonium salt.

Mandeville, BERNARD (c.1670–1733). Dutch-born English satirist. Born at Dordrecht, and educated at Rotterdam and Leyden, where he took his degree of M.D., he settled in London and practised as a physician. He died Jan. 31, 1733. His *Fable of the Bees*, which grew from a small volume of doggerel verse, *The Grumbling Hive*, 1705, into an elaborate treatise, was condemned by the Middlesex grand jury and attacked by William Law, Berkeley, and others. In a vein of coarse and impish wit and paradox he pictured a hive of vicious bees whose prosperity was ruined by their becoming virtuous. Maintaining that private vices were public virtues, he professed to find some ignoble and grossly selfish motive at the base of virtue.

Mandeville, GEOFFREY DE (d. 1144). English earl. Constable of the Tower and created earl of Essex in or before 1141, he took the side of the empress Matilda (or Maud), daughter of Henry I, against Stephen, but later deserted her cause and assisted in the siege of Winchester. By grants from Stephen he came to monopolise the judicatory power in Hertfordshire, Middlesex, and Essex, and surpassed all the other nobles in wealth and importance. He conspired once more with Matilda, was arrested, set at liberty again, once more rebelled, and, retiring to the fen country, led raids into the eastern counties. In one of these raids he was fatally wounded. This figure of feudal anarchy was the subject of a monograph by J. H. Round, 1892.

Mandeville, SIR JOHN. Reputed English author of a medieval book of travels. The earliest known version, written between 1357 and 1371, is in French, and the earliest English text is a faulty adaptation of this. The author of the travels states that he was born at St. Albans and had travelled widely in the East. A Latin version made at Liège declares that the book was written there, and a tomb was to be seen at Liège until 1798 with an inscription recording that Mandeville died there Nov. 17, 1372. The real author appears to have been a Liège professor of medicine, Jehan de Bourgogne. The first part of the book is a guide to the Holy Land for the use of pilgrims, plagiarised from a German traveller, William of Boldensele, and from others. The second part,

which describes more distant travels in Asia, is taken from Odoric of Pordenone and others. Among the marvels popularised by the book were those of Prester John, the fountain of youth, the earthly paradise, and the vegetable lamb.

Bibliography. Early Travels in Palestine, ed. T. Wright, 1848; Voyages and Travels of Sir J. M., ed. H. Morley, 1886, repr. 1905; The Buks of J. M., ed. G. F. Warner, 1889; The Travels of Sir J. M., ed. A. W. Pollard, 1900; Mandeville's Travels, ed. P. Harnelius, 1919.

Mandi. Administrative dist. of Himachal Union, India. It takes its name from the former Punjab hill state of Mandi, area 1,140 sq. m., absorbed in Himachal Union in 1948. Drained by the Beas, much of the area is forested, the deodar and blue-pine yielding valuable timber. It has an annual rainfall of 50 ins. Rice, wheat, and pulses are grown, a third of the fields yielding two crops a year. The capital, Mandi, is on the Beas, here spanned by a fine iron bridge. Founded in 1527, it is a trade centre for Sinkiāng, and is connected by a good road with the railhead at Pathānkot, 131 miles to N.W. Other towns are Sadar, Karsog, and Sundernagar. A hydro-electric scheme was completed in 1932. Pop. (1951) 310,626.

Mandible. Term applied to the jaw of vertebrates, and to the jaws or pincers of insects, crustaceans, and other animals.

Mandingo OR MANDE. Name denoting a sub-group of W. Sudanic languages. The negroid peoples, numbering several millions, by whom they are spoken include the Soninke or Sarakole of the middle Senegal; the Bamana or Bambara of the upper headwaters; the Vai of S.W. Liberia; the upper Niger Malinke; and many forest tribes in Sierra Leone and Liberia. This virile



Mandrake. Foliage, flowers, and root; inset, fruit

stock established the powerful medieval Mahomedan kingdom of Mali, which faded before the Songhai and Fula powers.

Mandla. Dist. and town of India, in the Jubbulpore division, Madhya Union. The district is situated N.W. of the Maikala Range, and is for the most part uncultivated, forested plateau. It is drained by the headstreams of the Narbada. The town of Mandla, on the Narbada, has 37 temples built between 1680 and 1858 on the banks of the river; it is connected by railway with Seoni and Betul. Other towns are Dindori and Niwas. Area 5,057 sq. m. Pop. (1951) dist., 547,620; town (est.) 12,000.

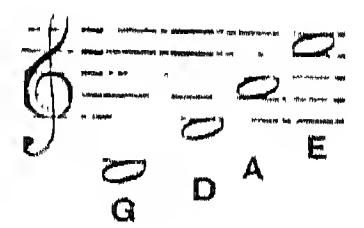
Mandoline. Musical stringed instrument with pear-shaped body and short neck. It is of the lute



Mandoline of Neapolitan type, with four pairs of strings

class but has pairs of strings tuned in unison. In the larger Milanese mandoline, with five or six pairs of strings, the tuning is similar to that of the lute; but the much commoner Neapolitan mandoline has four pairs of strings, tuned in fifths like the violin:

Mandoline strings are of gut for the lowest pair, and of steel for the others.



They are played with a plectrum, the special effect being produced by a tremulous movement of the hand, which keeps the strings in continuous vibration.

Mandrake (*Mandragora officinarum*) OR DEVIL'S APPLES. Perennial herb of the family Solanaceae. Native to the Mediterranean region, it has a thick, fleshy root, and large, oblong, lance-shaped leaves. The flowers are white or bluish, with network veining. The plant has a fetid smell and all parts of it have poisonous properties.

The mandrake was formerly used as a narcotic; the classical writers knew of it, and Shakespeare speaks of it as "the insane root that takes the reason prisoner." The forking of the root often produces a resemblance to the human figure, and from early times this, and its poisonous nature, surrounded the plant with superstitious beliefs. Its possession was said to bring good

fortune in all the affairs of life and it was pulled from the earth by attaching to it a dog, which, it was alleged, died of fright when the plant shrieked on being uprooted.

Mandrill (*Mandrillus sphinx*). Large species of baboon, found on the W. coast of Africa. The muzzle



Mandrill. Specimen of the brilliantly coloured West African baboon
W. S. Berridge, F.Z.S.

somewhat suggests the snout of a pig, the nose is a brilliant vermilion, and the swellings on either side of it are bright blue, and deeply ridged. The skin of the hinder part is shaded with purple, and the great callosities on the buttocks are bright red. The fur is olive brown, with a dark crest on the head, and a yellowish beard on the chin, which tends to turn white with age. The canine teeth are of great size and length. In its native state it goes about in troops, and is said to live on insects. In captivity it is morose and ferocious.

Mandu OR MANDUGARH. A ruined city of Dhar, Madhya Union state, 55 miles southwest of Mhow, in central India. Mandu was once the capital of the ancient kingdom of Malwa. To its buildings, of which the Jami Masjid is still in a good state of preservation and regarded as the best example of Afghan architecture in India, the great ruler Hoshang Shah (1405-34) made notable contributions. The city is on the summit of the Vindhya Hills, 1,944 ft. above sea level. It was once 37 m. in circumference and its ruins occupy 8 sq. m. Sir Thomas Roe, ambassador of James I, entered Mandu in the company of the emperor Jehangir, whose procession included 500 elephants.

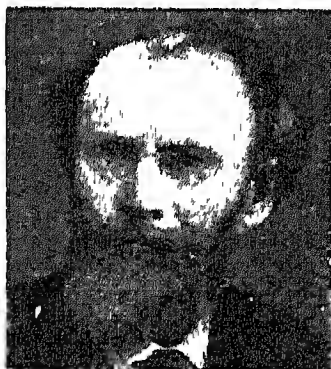
Manduria. Town of Italy, in the prov. of Taranto. Situated 22 m. E.S.E. of Taranto, it stands near the site of an older Manduria,

of which remains have been found. From tombs in the vicinity many gold ornaments, etc., have been recovered. An important stronghold in the 4th century B.C., it was captured by Rome, 209 B.C., and destroyed by the Saracens in the 10th century, the inhabitants building the present town, until 1700 called Casalnuovo (new village). The pop. in 1951 was 24,350.

Mandvi. Harbour of India, on the Gulf of Cutch, Bombay. It was the largest town in the state of Cutch. Pop. (1951) 29,305.

Manes (Lat., the good). Among the Romans and Italians generally, a name for the spirits of the dead. In imperial times they were regarded as gods, as is shown by the letters D.M.S. on sepulchral monuments — *Dis Manibus Sacrum*, sacred to the divine Manes. A general propitiatory festival of All Souls (Feralia) was held in their honour, Feb. 17, at which various offerings of food were brought to the tomb. Three times a year the Manes were supposed to come forth from their home in the underworld, to roam about the earth. Pits were dug near towns, resembling inverted domes, covered by a stone, called *lapis manalis*, which was removed with great ceremony on these occasions. The Manes are good, kindly spirits, as opposed to the Larvae and Lemures, bogies and hobgoblins. (Pronounced in two syllables.)

Manet, Édouard (1832-83). French painter. Born in Paris, Jan. 25, 1832, he studied under Couture, and in 1863 became the leading spirit of an iconoclastic group known as the *École de Batignolles*, which included Degas, Monet, Sisley, Fantin-Latour, and Pissarro. Manet broke, at least outwardly, so completely from classical traditions of beauty, form, and design that many of his works were the objects of general abuse, e.g. his *Déjeuner sur l'herbe*, now in the Louvre, which was rejected



Édouard Manet.
French painter



Édouard Manet. His fine painting, *The Bar at the Folies Bergère*, now in the National Gallery, London

by the Salon in 1863 and exhibited in the Salon des Refusés the following year. His great *Olympia*, 1864 (Louvre), *Christ Reviled by the Soldiers*, 1865, and *Angelina*, 1866, were similarly rejected and scorned. His paintings were derisively labelled impressionist. But his influence on Monet was such that the latter adopted the label proudly (see Impressionism).

While serving as a gunner during the Franco-Prussian war, 1870-71, Manet perceived the beauty of open-air painting, and the popularity of the *plein-air* school owed much to his subsequent work. His later paintings, e.g. *Le Bon Bock*, 1873, and *The Bar at the Folies Bergère*, 1882 (now in the National Gallery, London), won him wide esteem at last, and he has since become recognized not only as an important figure in the history of art but as in himself a great painter whose works have an intrinsic beauty and reveal an uncommon mastery of technique. Zola, who supported him throughout the controversy, wrote a biography, 1867. Consult also *Life* by J. E. Blanche, Eng. trans. 1925.

Manetho (Egypt. Manethoth, given by Thoth). Egyptian priest and writer. Born at Sebennytus (Semenud) in the Nile delta, he became chief priest and keeper of the sacred records at Heliopolis in the reigns of Ptolemies Soter and Philadelphus (323-247 B.C.). He was the author of *Aegyptiaca*, a history of Egypt from the earliest times to Alexander the Great. Some fragments are preserved in Josephus and in later chroniclers. His arrangement of the Pharaohs in dynasties is still retained by historians of Egypt.

The poem *Apotelesmatika*, formerly attributed to him, was written by a later Manetho.

Manettia. Genus of evergreen climbing plants, of the family Rubiaceae. Natives of tropical America, they have more or less oval leaves and funnel-shaped flowers of yellow, white, or red, according to species.

Manfalût. Town of Egypt. It is situated on the Nile, below Assiut, 222 m. by rly. S. of Cairo and 27 m. by river from Assiut. There are Coptic churches, and woollen factories. Date brandy is manufactured for local consumption and export. Near are the crocodile mummy pits of Maabda. Mehemet Ali here united his troops in 1820. Pop. 14,500.

Manfred (1231-66). King of Naples and Sicily. A natural son of the emperor, Frederick II, he was made prince of Taranto, and in 1257 with Saracen aid usurped the kingdom of Naples and Sicily. Excommunicated by Alexander IV, Manfred entered the Papal States, and from Tuscany southwards the whole Italian peninsula throve under his rule. He fell in the battle of Benevento, Feb. 26, 1266.

Manfred is the title of a dramatic poem by Byron. The central idea of the play is the unexplained remorse of the magician Manfred. It was published in 1817, but was not staged until 1863, though it had been set to music by Schumann eleven years previously.

Manfredonia. Town and harbour of Italy, in the prov. of Foggia. It stands on the Bay of Manfredonia, at the base of Monte Gargano, 23 m. by rly. N.E. of Foggia. Founded in 1263 by Manfred (*q.v.*), it still retains part of its medieval walls and castle. Two m. S.W. is the fine cathedral of S. Maria di Siponto (consecrated 1117), part of the remains of ancient Sipontum (*q.v.*). Manfredonia was destroyed by the Turks in 1620, but was afterwards rebuilt. The 8th army captured it Sept. 29, 1943, during the Second Great War. Only the castle was seriously damaged. Many of the inhabitants are employed in the fisheries. The neighbouring lagoons yield large quantities of salt. Figs, almonds, and carobs are exported in quantity. Pop. (1951) 31,106.

Manfredonia, GULF OF. Wide opening of the Adriatic Sea, on the S.E. coast of Italy. It is bounded N. by Monte Gargano, washes the shores of the provinces of Bari and Foggia, and is 32 m. wide at its mouth.

Mangabey (*Cercocebus*). Group of monkeys found in W. and E. Africa, and usually distinguished by the presence of white or flesh-



Mangabey. Specimen of the crested or grey-cheeked West African monkey

coloured eyelids. They are nearly related to the macaques (*q.v.*), but are of more slender build and have a shorter muzzle and smaller callosities on the buttocks. They are long-tailed, and the general colour of most of the species is blackish. Remarkably docile and good-tempered, these monkeys make excellent pets. See Monkey.

Mangaia. One of the largest of the Cook Islands, Pacific Ocean. It is a dependency of New Zealand, 116 m. from Rarotonga. The island is 30 m. in circumference and is of volcanic origin, and on the E. is a wide expanse of infertile basalt. Inland a short distance from the shore is a wall of dead coral, 100 ft. in height, which goes round the island. Within this coral rampart there are swamps and the central plateau, 650 ft. in elevation. Copra, coffee, and oranges are exported. Pop. 1,845.

Mangalia. Town of Rumania, in the Dobrogea (Dobruja). It stands on the shore of the Black Sea in the S.E. of Rumania, and has road connexions with Constanta, 35 m. to the N., and Bazargic. In the Middle Ages it was a flourishing port, trading with Italian ports; the harbour is inadequate for large ships. Pop. 2,776.

Mangalore. Town of India, in Mysore, headquarters of the S. Kanara dist. It is situated on the Malabar coast on a backwater formed by the Netravati and Gurpur rivers, and has a harbour used in fair weather by small vessels. It is 407 m. S.S.E. of Bombay. The main line rly. from Madras through the Palghat gap to Calicut terminates here. There are roads across the W. Ghats to Mysore and Coorg. Educational facilities include three colleges. Coffee is the chief export, while nuts and pepper are also exported. Coarse cloth is manufactured.

A quarter of the people are Christians; the Jesuit mission

dates from 1880. In the 14th century it was a famous centre of commerce. Sacked in the 16th century three times by the Portuguese, it became in the 18th century the principal port for the rulers of Mysore. Captured by the British in 1768, retaken in 1784, it was held by the British in 1799. Pop. (1951) 117,083.

Mangan, JAMES CLARENCE (1803-49). Irish poet. Born in Dublin, May 1, 1803, the son of a grocer, he received an excellent education, but owing to intemperance was never able to achieve any solid success, though some of his poetry is of a high order. He died of cholera, June 20, 1849.

An incomplete edition of his poems, which include renderings from Irish, was published with a biographical note by J. Mitchel, 1859, and a centenary edition, edited by D. J. O'Donoghue, in 1903. Consult Life and Writings of Mangan, D. J. O'Donoghue, 1897.

Manganese (Ital. corruption of *magnesia*). Metallic element used as a scavenger to remove impurities in the making of steel and many non-ferrous alloys. Manganese steel contains up to 17 p.c. of manganese. The mineral pyrolusite, an oxide of manganese, was named magnesia by Pliny. It was used under the name lapis manganeus in the manufacture of white glass, as its action counteracts the green tints. The black Derbyshire Wad was, and still is, used to make black oil-paint. Until late in the 18th cent. manganese was thought to be a compound of iron, but in fact it contains only small amounts of iron. First isolated in 1774 by J. G. Gahn, the Swedish chemist, it was named manganese in 1808, after the isolation of the true magnesium by Davy. The element, chemical symbol Mn, is one of the elements in the first long period of the periodic table, being associated with iron, cobalt, and nickel on the one side and chromium, vanadium, titanium, and scandium on the other. It has atomic number 25, atomic weight, 54.93; melting point, 1242° C.; boiling point, 1900° C.; density, 7.39 gm. per c.c.; electrical resistivity about 5×10^{-6} ohm cm. Manganese exists in



J. C. Mangan, Irish poet

From a drawing after death, by Sir F. Burton

two crystal forms, alpha-manganese and beta-manganese, both of which are complex in nature and probably contain manganese atoms in different states. The element has two free-valency electrons, but probably forms six different oxides, among them being MnO , Mn_3O_4 , Mn_2O_3 , and MnO_2 .

The chief ores of manganese are pyrolusite, MnO_2 , containing 63 p.c. Mn and 37 p.c. O_2 ; braunite, Mn_2O_3 ; hausmannite, Mn_3O_4 ; manganite, $\text{Mn}_2\text{O}_3 \cdot \text{H}_2\text{O}$; psylomelane, similar to pyrolusite; rhodonite or manganese spar, MnCO_3 ; wad or bog manganese in which it is associated with iron, cobalt, or copper and water; and manganese blende, MnS . The minerals are widely dispersed and Blumenbach at the beginning of the 19th cent. said that "most of the black, dendritic marks in various stones depend upon the presence of this substance." Various ores are used directly in their native conditions, in the preparation of glass, the colouring of pottery, tiles, and bricks, for bleaching, where their facility for yielding nascent oxygen is of value. High grade pyrolusites are used for the manufacture of dry batteries and also for the removal of sulphur from gases produced from coal. The chief sources of such high grade ores are in the U.S.S.R. and parts of the British Commonwealth—India, the Gold Coast, and S. Africa. The U.S.A. imports ores from Brazil, Cuba, and the Gold Coast.

Sedimentary Deposits

In sedimentary deposits manganese has been precipitated in beds or nodules invariably accompanied by iron compounds on lake-bottoms or on sea-floors—this process is taking place at the present time in the deep sea. The elevation of these deposits above water-level may give commercial deposits, especially if concentration by natural chemical or mechanical processes takes place. The sedimentary concentration of manganese in lakes may also be accomplished by the action of bacteria or algae, giving rise to bog-manganese deposits in e.g. Sweden, Spain, and the U.S.A. The extensive deposits of nikopol in the Ukraine and chiaturi in the Caucasus are examples of sedimentary ore-bodies formed by bacterial agencies which have been elevated and reconcentrated by natural processes.

The metamorphism of sedimentary or residual deposits may result in workable concentrations

of hausmannite, braunite, and franklinite, as at Franklin Furnace, U.S.A., and in Sweden.

Processes and Uses

The metal can be obtained by reduction of the dioxide by carbon in the electric arc furnace, when it contains varying amounts of carbon as an impurity. An alternative is to use the thermit process, reducing Mn_3O_4 with aluminium, in much the same way as chromium can be produced. Metal of very high purity can be obtained by electrolysis of a solution of manganous chloride, using a mercury cathode. The amalgam formed with the mercury is collected and the mercury distilled off under vacuum at 250°C . The crude metal produced in the first case has a coarse, silvery, crystalline fracture tinged with yellow or red, but the electro-deposited metal is silvery-white. The pure metal is extremely hard and brittle: glass can be scratched with it. Although it can be obtained of a purity greater than 99.98 p.c., so far it has not been of use as a metal by itself, but it is used in many alloys. Alloys with copper and nickel are used for electrical resistances, while the high-tensile brasses or manganese bronzes (*q.v.*) are widely used in both cast and wrought forms, particularly where resistance to sea water corrosion is important. Manganese is used in aluminium alloys to improve their mechanical properties and in magnesium alloys to increase resistance to corrosion.

But the principal use of manganese is in the iron and steel industry. The pure metal is rarely added to ferrous materials; it is added either as ferro-manganese or as spiegel-eisen. Ferro-manganese is the crude pig metal, manufactured either in a blast or an electric arc furnace by a process similar to that used for the pure metal. It contains 65–85 p.c. of manganese. Spiegel is really a manganiferous cast iron; it contains 5–25 p.c. of manganese. Both these alloys contain 5–7 p.c. carbon; a special variety of spiegel, silico-spiegel, contains as much as 10 p.c. of silicon. The manganese alloy is added to the steel just before pouring. It acts primarily as a deoxidiser, removing any ferrous oxide, which would otherwise make the steel unworkable. It also converts the iron sulphide, which would form films round the individual steel grains, into manganese sulphide, which is globular and comparatively harmless. The oxidised man-

ganese forms a readily fusible slag, which can be removed from the top, but the excess alloys with the iron and improves the properties of the steel. Hence most carbon steels contain 0.5–0.7 p.c. of manganese, while as much as 1.5 p.c. is added to give the perlite manganese steels, which are stronger and tougher than the plain carbon steels. The austenitic manganese steels, containing 12–15 p.c. of manganese, are very subject to work-hardening. They are therefore used for such machines as ball mills, jaw-crushers, and rly. points, where the surfaces are subject to abrasion and so become work-hardened continually during use. Manganese is also added to cast irons.

Various manganese salts are used in the chemical and dye industries, perhaps the best known being the red-purple potassium permanganate, used as a disinfectant. The element occurs in many mineral waters and plants, chiefly cereals and certain vegetables. *See* Cast Iron; Manganese Bronze; Steel; Metallurgy.

Manganese Bronze. Customary name for what is really a high tensile brass. The composition is similar to the normal 60/40 brass, but contains various alloying additions which vastly improve its mechanical properties. The alloying elements replace the zinc, having effects in accordance with Guillet's Equivalents (*q.v.*). Typical alloys might contain 2–4 p.c. of aluminium and manganese, and they would have a tensile strength of about 40 tons per sq. in. with an elongation of 15–25 p.c. They make excellent castings and forgings, and are used for marine propellers and rudders, where their resistance to sea water corrosion is of benefit, for gun mountings, car fittings, etc. *See* Brass; Bronze; Manganese.

Manganin. An alloy containing approx. 83 p.c. copper, 13 p.c. manganese, and 4 p.c. nickel. It is used in wire form for standard electrical resistances as it possesses a remarkably low temp. coefficient of resistance.

Manganite. An ore mineral of manganese, one of the hydrated manganese oxides ($\text{Mn}_2\text{O}_3 \cdot \text{H}_2\text{O}$), occurring as bundles of black prismatic crystals or in stalactite form. It is found in veins associated with other manganese minerals and may change to pyrolusite (*q.v.*)

Mangbettu or Monburtu. Negroid people of Sudanic affinity, most of them in the upper Welle and lower Welle districts of the

Belgian Congo, formerly feared for their cannibalism. They are noted as skilled potters, sculptors, and boatbuilders, and their huts are larger and better built than those of surrounding peoples. They were the penultimate invaders of the Azande area, where by the 19th century they had established powerful kingdoms, but subsequently they gave way to the Aoungara.

Mange. Name given to parasitic skin diseases of animals. There are two types of parasite giving rise to two different infections: sarcoptidae (scabies in man) and demodecidae (follicular).

Sarcoptic mange is caused by various members of the sarcoptic family affecting animals in different ways. These parasites affect man and all domestic animals including birds. They give rise to constant and often acute irritation of the skin, loss of hair, soreness and crustiness of the skin, and often loss of general condition. Sarcoptic mange is not infrequently transmitted from dog to man. Noticeable symptoms are seen within a month of infection. Psoroptic mange in sheep (sheep scab) and sarcoptic mange in horses are diseases which on discovery must be reported to the ministry of Agriculture and Fisheries. Treatment will take from three to eight weeks. Sulphur ointment and various watery and oily sulphur preparations are commonly used. Benzole benzoate and preparations of this product may give rise to toxic symptoms, especially in the cat.

Follicular mange is found on the skin of man, dog, ox, pig, and goat; rarely on that of the horse and other animals. The parasite is found in the hair follicles and sebaceous glands. It causes little irritation, but loss of hair is complete over the affected patches, which may cover the whole body



Mango. Specimen of the East Indian tree in fruit

surface. In late stages the condition is seriously complicated by addition of a staphylococcal infection. Cure may take from three weeks to several months according to the resistance of the parasite. Some cases prove incurable. Treatment has usually been confined to sulphur ointment or some oily preparation containing sulphur. More recently crystal violet and brilliant green have been used with varying success. Penicillin and thiazamide will combat the secondary invasion of the staphylococcus.

Mangin, CHARLES MARIE EM-MANUEL (1866-1925). A French soldier. Born at Sarrebourg, July 6, 1866, he passed into St. Cyr in 1886. He was on active service in the Sudan, 1889-99, and took part in Marchand's expedition to Fashoda. He was in Tongking 1901-04. In 1910 he was a colonel on the W. African staff, and in 1913 was appointed brigadier-general, commanding the 8th infantry brigade.



C. M. E. Mangin,
French soldier

In the first battle of the Marne, 1914, Mangin led the 5th infantry division. In 1916 he was fighting at Verdun, was made temporary general of division, then full general. During the Verdun operations he recaptured Douaumont and Vaux. Criticised for his conduct in the offensive of April, 1917, he was exonerated after a searching inquiry. Given the 10th army in 1918, he conducted on June 11 the counter-attack which arrested the German offensive on Compiègne; and from July 18 to Aug. 2 took a leading part in the counter-offensive which forced the Germans to retire on the Marne and the Aisne. On Aug. 20 he drove the enemy to the Oise and the Ailette. He was appointed grand cross of the legion of honour, and died May 12, 1925.

Mango (*Mangifera indica*). Evergreen tree of the family Anacardiaceae. A native of the East Indies, it attains a height of about 60 ft., and its leaves are oblong lance-shaped. The yellowish flowers streaked with orange form dense clusters, and are succeeded by bunches of kidney-shaped fruits, 3-6 ins. in length and nearly half as broad, with tough green skin and yellow pulp, enclosing a fibrous-coated seed. The fruit of the best cultivated kinds is very delicate. It is also used in the manufacture of chutney and preserves.

Mangold (or Mangel) Wurzel (Ger., beet-root). Cultivated variety of the sea beet (*Beta maritima*), principally used for feeding stock. Belonging to a different family (Chenopodiaceae) from turnip and swede, which are Cruciferae, mangolds require somewhat different cultural treatment, especially as regards manures. There are three leading types, the long red, the globe-shaped yellow, and the tankard, which is of intermediate shape. The crop takes longer to mature than turnip or swede, and has to be sown before them. Also, being deeper-rooted, it can thrive with less rain, and is more tolerant of heat. It is not eaten on the ground, nor will it stand the winter if left in the soil, and it is stored for winter and spring feeding.

The "seeds" are really fruits, from each of which two or three shoots may arise. Uniform drilling is secured by previously milling these fruits so as to set free the true seeds. Sowing takes place in April or May, at the rate of 6 to 8 lb. of seed per acre.



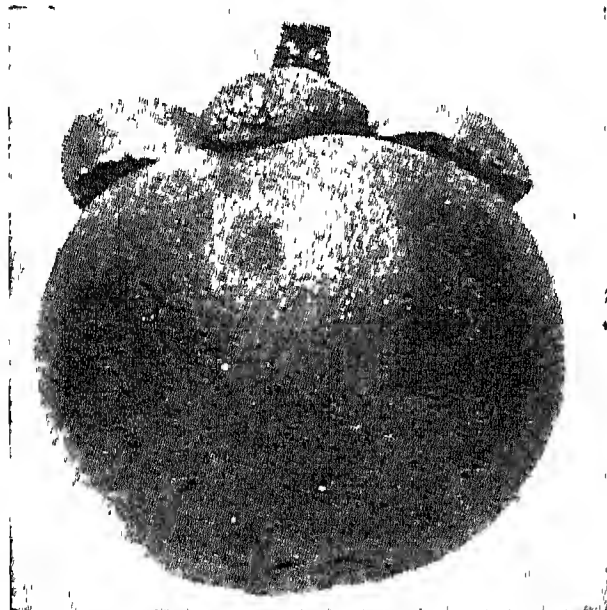
Mangold Wurzel. Leaves and root of the beet used for feeding stock

The best crops are raised on deep clay loams, but good results can be obtained on a great range of soils. Heavy dressings of manure are required, as the crop is a gross feeder. Dung does not supply the necessary nitrogen, and has to be supplemented by some form of nitrogenous manure. Potassic manures are essential, and salt has a good effect, as might be expected when the origin of the mangold from a shore plant is remembered. The roots are pulled by hand before the frosts begin, usually in late Oct., the tops being either twisted or cut off. Pitting or clamping in the field is the usual method of storage. On good soils an average of from 40 to 60 tons per acre may be expected.

Mangonel. Medieval siege engine, also known as the trebuchet. Presumably a modification of cer-

tain Roman engines, it was used to throw heavy stones or incendiary missiles over walls. It consisted of a heavy base carrying a vertical frame at the front end, fitted with a crossbar at the top. A beam was pivoted lower down the frame and carried a cup at the rear end, while it could be loaded either with a heavy counterweight or twisted cords in such a manner that there was a tendency to pull the beam into a vertical position. The end of the beam was held down against this action by a catch, and the missile placed in the cup. When the catch was released the beam sprang up, and when it struck the crossbar projected the missile upward and forward for a considerable distance. Engines embodying exactly this principle and of the same general construction were used in the earlier period of the First Great War for throwing grenades and heavier bombs, the motion being obtained by strong spiral springs in place of cords.

Mangosteen (*Garcinia mangostana*). Small evergreen tree of the family Guttiferae, native of



Mangosteen. Fruit of this East Indian tree

the Moluccas. It has elliptic, leathery leaves, and rose-like red flowers with waxy petals, succeeded by fruits the size of an orange with leathery, dark-purple rind, enclosing a white pulp which Burbidge describes as possessing "a flavour which is like the finest nectarine, but with a dash of strawberry and pineapple added." An infusion of the dried rind makes an astringent drink used in the treatment of dysentery.

Mangotsfield. Urban district of Gloucestershire, England. It includes Downend, Mangotsfield, Soundwell, and Staple Hill. About 5 m. N.E. of Bristol, it has a rly. junction for the Midlands and the S. coast. The district, formerly a mining one, now depends chiefly on manufacture of boots and shoes, clothing, and chocolate. The

church of S. John was rebuilt in 1850. At Downend W. G. Grace was born. Pop. (1951) 17,871.

Mangrove (*Rhizophora*). Genus of trees of the family Rhizophoraceae. Natives of tropical coast swamps, they have thick, leathery leaves of elliptic form, and large flowers. The trunk sends out roots above the water-line, as well as below it, and these extend laterally for some distance before arching down into the mud. The branches also send down prop-like roots similar to those of the banyan. The fruits are inversely pear-shaped, and the seed germinates while the fruit is still hanging on the tree. The seedlings grow in this position until they have stems several feet in length, with roots at the lower end and a leaf bud at top, when they drop into the mud and continue their growth. The fruits of the common mangrove are edible, and their fermented juice provides a kind of wine. The bark is used for tanning and dyeing; also as a fever medicine.

Mangrove, WHITE (*Avicennia nitida*), OR **COURIDA**. Small evergreen tree of the family Verbenaceae, native of S. America. It has opposite, narrow-oblong leaves, and inconspicuous flowers in terminal clusters. The trees grow in mud-banks along the coasts, their roots forming a network which holds the mud. Vertical branches arise from the roots to assist in the work, which has had the effect of converting thousands of square miles of muddy coast into firm land. For the story of the Courida's reclamation work, *consult* In the Guiana Forest, J. Rodway, 1894.

Manhattan. Island at the mouth of the Hudson river, U.S.A. It is 12½ m. long, with an extreme breadth of 2½ m., and forms the smallest of five boroughs which comprise New York city. Each bor. is also a co., Manhattan constituting New York co. It lies E. of the Hudson, and is bounded N. by the Harlem river and ship canal; 230th St.; and Marble Hill; E. and S.E. by Harlem and East rivers (in reality estuaries); and S. by Upper New York Bay. Battery Point is the S. extremity. Several

fine bridges give access to other parts of the city.

The most populous borough after Brooklyn, Manhattan includes the most noted features of the city, e.g. the famous skyline of the world's tallest buildings, Wall St. (financial centre), piers and docks of the largest ocean-going ships, New York civic centre, federal and state buildings, museums and art galleries, Fifth Avenue shops, Broadway (*q.v.*), with its theatres and night clubs, and the smartest and most expensive residential areas in the upper E. side streets, and along the upper East river. Pop. (1950) 1,938,551.

Mani, **MANES**, OR **MANICHAEUS** (215-276). Persian religious reformer, whose real name is said to have been Cubricus. An ascetic from his youth, he formulated a system to supplant Zoroastrianism (*q.v.*), proclaimed himself a messenger of the true God, surrounded himself with apostles, found some favour at court, and went on missionary journeys. Forced into exile by the priests, he won the support of Hormisdas I, but in the reign of Bahram I, when the priestly party again came into power, he was seized and crucified, his body being flayed, stuffed with hay, and nailed to the city gate that was later named after him. Of his numerous writings only fragments remain. See Manichaeism.

Mania (Gr. madness). Form of mental illness characterised by excitability and loss of emotional control. The patient's ideas are confused and disordered, his judgement is impaired, he cannot focus his thoughts on any one subject or think or talk coherently. He is unable to take care of himself and may



Mangrove. Trunk and roots of *Rhizophora mangle*

be a danger to others. An attack may come on suddenly, but occasionally develops gradually. During the acute phase the patient talks continuously, may shout or sing, experiences delusions and often hallucinations of sight and hearing. He may want to embark on all kinds of fantastic schemes, believe that he is a millionaire or someone very exalted. He often thinks that he is surrounded by enemies and that people are trying

to injure or insult him. He resents any attempt at control and may become violent if opposed. He is usually most hostile towards his family and friends. He frequently refuses food and is unable to rest or sleep. The condition if unchecked soon leads to exhaustion.

Mania may occur as a result of (1) toxins such as alcohol, or infections by bacteria or viruses which affect the brain; (2) a period of extreme strain or fatigue: a number of cases occurred during the retreat from Dunkirk in 1940; it sometimes arises after severe emotional distress; (3) unknown causes: the most common of these is Cyclothymia (recurrent manic-depressive insanity). In this condition attacks of mania may alternate with phases of depression. In the British Isles the incidence of maniacal phases is much less than that of depression, but in many other countries the reverse is true. How this disease operates is not fully understood.

Occasionally an attack of mania arises at the menopause; it does not usually recur. It may also occur after childbirth, and may clear up or remain permanent in a more or less chronic form.

Treatment consists in removing the cause, if known, and in giving sedatives to quieten the patient and prevent exhaustion; psychotherapy is often of help.

Manicaland. District partly in Rhodesia, and partly in Mozambique. The Manicaland goldfield has long been worked. The richest reefs are in the Penhalonga mountains; water supply is abundant, and some ore is obtained by quarrying. The dist. is 150 m. S.E. of Salisbury and 220 m. N.W. of Beira. See Africa; Umtali.

Manichaeism. Religious system of W. Asia, founded by Mani (q.v.) in the 3rd century A.D. Mystical and dualistic, and aiming at an explanation of the problem of human existence, it consisted of a fusion of Parsee metaphysics, Buddhistic morals, Babylonian mythology, and certain elements of Gnosticism and Christianity. The dualism was of the regions of light and darkness, mingled in the visible world. Salvation was regarded as attainable by knowledge of the true nature of the universe and the final separation of spirit (light) from matter (darkness). Manichaeism ruled out the O.T. Christ was regarded as a messenger of the light, but the apostles had misrepresented Him, and Mani was the promised Paraclete.

The followers of Manichaeism were divided into the Elect, bound, after the example of the founder, to an ascetic rule that forbade defilement by mouth, hand, and bosom; and the Hearers, from whom the mysteries were concealed. The Elect went direct to Paradise, the Hearers to a kind of Purgatory, the non-Manichaeans to Satan. There was an ecclesiastical system, and the simple worship included prayer, singing, fasting, and the observation of baptism and communion. One great festival, the Bema (pulpit), was observed on the anniversary of the death of the founder. Faustus, an African bishop (fl. 400) and the most eloquent of Manichaean teachers, placed morality before doctrine as a test of the true believer. The system spread to India, Turkistan, Syria, Palestine, and Egypt. Forms of it appeared among the Paulicians, Bogomiles, Cathari, and Albigenses.

Manicure (Lat. *manus*, hand; *cura*, care). Term applied to the care of the hands and finger nails. It is now an essential part of the toilet, and the services of a manicurist are provided for both men and women by most coiffeurs. Manicure can be carried out personally without elaborate apparatus. The hands are first soaked in a lather of good soap to which a little eau de Cologne or toilet vinegar has been added, together with lemon juice. They are thoroughly dried, and after cold cream has been rubbed into the base of the nails, the cuticle should be pushed back with an orange stick; metal must not be used. The nails should be trimmed with curved-bladed scissors, care being taken not to press the points too deeply below the free edge, otherwise the nail will develop bruises and white spots. When filing the nails to shape, an emery board should be used in preference to a metal file; the latter may bruise or scratch the nail. The nails are rubbed with a suitable powder and then polished with a chamois-leather buffer.

Application of varnish preserves the polish. This varnish may be colourless, but modern Western fashion has revived among women the ancient Egyptian custom of colouring the finger nails with various shades of red or pink varnish. In Eastern countries henna is used for tinting. In China long nails among men were once an indispensable sign of high rank, but their inconvenience led to disuse, though sometimes one nail is allowed to grow, protected

by a sheath. In Spain it is customary for both sexes in the leisured classes to allow the nail of the little finger of the right hand to grow long as a sign of freedom from manual labour. In most countries today women at least have fairly long pointed nails.

Manifest. Term used for a document that contains a description of the articles contained in the cargo of a ship, and particulars about their destination. Every vessel carrying goods must have a manifest, to be delivered to the Custom House officers at the port of destination. It is one of the ship's papers, which in time of war are usually inspected when a vessel is boarded either to search for contraband or for other purposes.

Manifold. Machine for producing a number of facsimile copies of a plan or document from a single original. Sometimes it is called a duplicating machine or mimeograph. The earliest type of manifold was the hektograph, introduced about the middle of the 19th century. Its operation is based on the principle of absorption; the original writing or drawing is done on a sheet of hard bond paper with a water-soluble ink, and the sheet placed in contact with a moist surface of gelatine composition; the writing is then absorbed from the paper and impressed in reverse on the gelatine surface. By placing a sheet of dry paper on the moist surface, the impression is transferred to the paper. This type of manifold is still used for the reproduction of large drawings and plans, up to 100 copies being obtained from a single impression.

For the reproduction of large numbers of copies stencil methods are now chiefly used. In the early stencil manifolds, the stencil was made on a sheet of wax-covered paper, which was written upon either with a stylus or with a typewriter from which the ribbon had been removed. Waxed paper has now been replaced by sheets of tough, flexible tissue. The stencil is fastened over a hollow, revolving cylinder partially covered by an inked pad. Each revolution of the cylinder brings the stencil in contact with the paper, and the ink, passing through the letters or outline of the drawing, makes the impression. In 1902 the automatic, electrically-driven rotary duplicator was patented by David Gestetner; this can reproduce 5,000 copies an hour.

Photocopying machines are used for the rapid reproduction of

titles, deeds, contracts, etc. The machine combines a camera with developing and fixing tanks. A roll of sensitised paper photographs the original and then automatically passes through the fixing and developing baths. As the photographs are made through a reversing prism, the lettering or drawing appears exactly as in the original. It is also possible to print two sides of a page simultaneously.

Manifold. River of Staffordshire, England. A tributary of the Dove, which it joins 3 m. N.W. of Ashbourne, it is noted for its sinks or swallets. Near Thors Cave it disappears and comes to the surface again in the grounds of Ilam Hall, flowing underground for a distance of 4 m.

Manihot. Genus of American shrubs and herbaceous plants of the family Euphorbiaceae. See Tapioca.

Manila. City of the Philippine Islands. Chief port and capital of the republic, it stands on the



Manila arms

west coast of Luzon at the entrance of the Pasig river into Manila Bay. The Pasig divides Manila into two portions, the old walled city lying to the S. and the modern suburbs to the N. The former, reduced to rubble in 1945 (*v.i.*), was enclosed by a 16th century wall and contained the most important buildings. These included the 16th century cathedral, the archbishop's palace, the university, government buildings, convents, hospitals, colleges and schools, and the observatory.

The chief industries included cigars, cigarettes, tobacco, distilled and malt liquors, Manila hemp products, and textiles. There were also foundries, machine shops, boot and shoe and furniture factories, flour-mills, and ship- and boat-building yards. Although its industry was much damaged during the Japanese occupation, Manila exports hemp, copra, sugar, and tobacco, and imports cotton goods, rice, machinery, chemicals, and food stuffs. From the time of its acquisition by the U.S.A. to the Second Great War the city underwent a remarkable transformation. The harbour was greatly improved, electric lighting and tramway systems were provided, telephone services installed, and the drainage entirely remodelled. The water supply was

also improved by the adoption of gravity works, the water being carried about 24 m. to a large reservoir some 200 ft. above sea level.

Manila was founded by Spaniards in 1571, and about 20 years later was strongly fortified. It suffered at the hands of the Dutch at the beginning of the 17th century, and from 1762 to 1764 was in British occupation. The Filipinos began to manifest a feeling of discontent with Spanish rule in 1890, and from 1896 until the American declaration of war against Spain much skirmishing took place. The sinking of the Spanish fleet in Manila Bay was the signal for further action by the insurgents under the leadership of Aguinaldo, and on Aug. 13 the city was forced to capitulate to an American army. Friction then ensued between the Americans and the Filipinos, who attacked the city on Feb. 4, 1899, but were defeated.

During the Second Great War the U.S. authorities declared Manila an open city, Dec. 25, 1941, but Japanese bombers attacked it next day, destroying many buildings. MacArthur evacuated Manila and the Cavite naval base, the Japanese entering on Jan. 2, 1942. U.S. troops advancing from three sides entered Manila, Feb. 4, 1945. The part of the city on the N. bank of the Pasig was under U.S. control by the 6th, but the Japanese retired to Intramuros, the old Spanish walled city on the S. bank, blowing up the bridges behind them, and held out there until Feb. 24. Intramuros was reduced to rubble.

The town suffers from earthquakes. The first recorded shock

was in 1599, and that of 1862 was the most calamitous: it threw down the cathedral and nearly 600 buildings, many people being buried in the debris. The senate, treasury, and mint were nearly destroyed by fire in 1920. New govt. buildings were under construction at Quezon City, 10 m. N.E., in 1948. Pop. (1953 est.) 1,200,000.

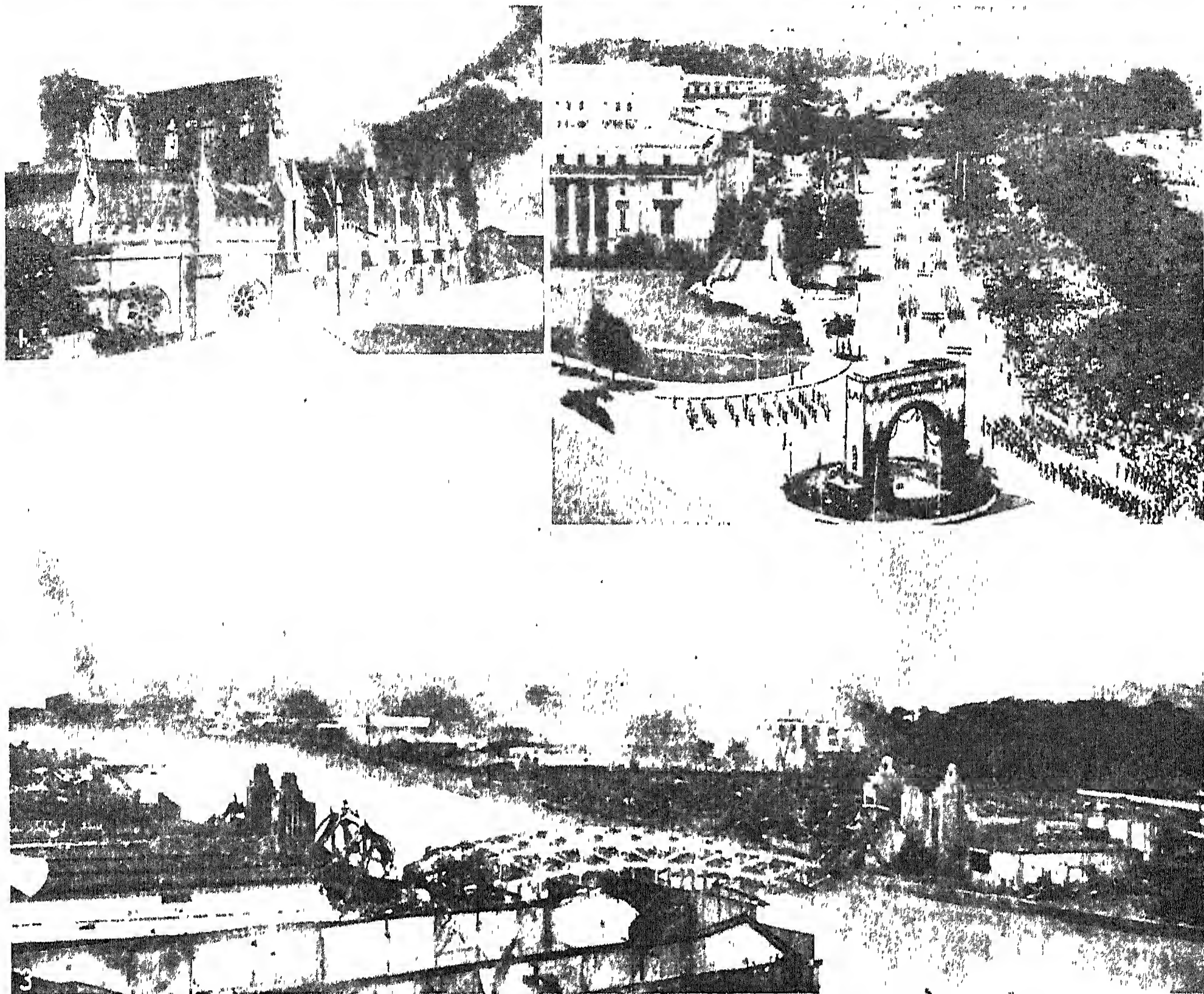
Manila, UNIVERSITY OF. Educational centre in the Philippines. Inaugurated in 1585, when Philip II of Spain gave authority for its inception, the university of Manila began when the college of S. Joseph for the aristocracy was opened by the Jesuits in 1601, and, ten years later, the college of S. Thomas was established by the Dominicans for poor Spaniards and natives. After 1619 degrees were granted by the colleges, which became the university in 1644, when a school of law was added. In 1730 the university was closed. The existing institution arose in 1857, and in 1871 medical and pharmaceutical schools were opened. Modelled on American lines, the university has faculties of canon and civil law, engineering, medicine, education, pharmacy, philosophy and arts, and theology. Although closed during the Japanese occupation, 1912-45, it was reopened soon after liberation.

Manila Bay. Large inlet of the China Sea in S.W. Luzon, Philippine Islands. Triangular in shape, it communicates with the sea by a passage 11 m. wide; N. of the passage the shore of the peninsula of Bataan is high and forested; the Cavite shore on the S.E. is low, while most of the Manila shore on the N.E. is occupied by the marshy delta of the Pampanga. The bay is deep, with good anchorages at Cavite and Manila, and is the finest harbour in the Far East. For accounts of the fighting in the Second Great War see under Bataan Peninsula; Manila; Luzon.

Manila Bay, BATTLE OF. Naval engagement in the Spanish-American War, May 1, 1898. War had been declared five days when Commodore Dewey, then at



Manila, Philippine Islands. Plan of the city and its suburbs, showing the harbour and principal quays



Manila, Philippine Islands 1. Santo Domingo church, a famous shrine, burning after the Japanese raid of Dec. 27, 1941. 2. Japanese troops parading past the Legislative Building, Oct. 14, 1943, to celebrate their gift of "independence" to the Filipinos. 3. Fires started by the retreating Japanese as U.S. troops advanced to liberate the capital, Feb., 1945

Photos, U.S. Official

Hong Kong, was ordered to attack the Spaniards in the Philippine Islands. Arriving on the night of April 30, he entered Manila Bay, attacked early the next morning, and destroyed the fleet of ten ill-equipped and almost immobile vessels under Admiral Montojo. See Spanish-American War.

Manila Hemp OR ABACA. Fibre obtained from *Musa textilis*, a plant of the banana family. The native name of the plant is Abaca. It is a native of the Philippine Islands and is now grown in many tropical countries. The outer fibre is very strong and makes excellent ropes. The old ropes, unravelled and picked, are made into Manila paper. The fine inner fibres are worked into dress fabrics by the natives, and in Europe are manufactured into veils, handkerchiefs, and articles of clothing. These fine fabrics are known as grasscloth, though the plant is not a grass. As a binding medium for builders' plaster, Manila hemp is stronger than animal hair. See Hemp.

Manila Tamarind (*Pithecolobium dulce*). Large tree of the family Leguminosae. It is a native of Mexico, but is extensively grown for its fruit in the Philippines and India. The leaves are twice divided into small leaflets, and the clustered whitish flowers are tubular. Long cylindrical pods, curled at the top, contain glossy seeds embedded in sweet edible pulp.



Manila Tamarind. Flower sprays and foliage. Inset, left, flower; right, seed pod

Manilius, GAIUS (1st cent. B.C.). Roman tribune of the people. A strong supporter of Pompey, in 66 B.C. he brought forward a proposal that Pompey, who had already cleared the Mediterranean of pirates, should be entrusted with the supreme command in the war against Mithradates, with unlimited powers. The proposal was supported by Cicero.

Another Manilius whose praenomen is unknown, was the author of a Latin poem in five books, written in hexameters, entitled *Astronomica*. Nothing is known except that he lived during the reign of Augustus, as is evident from certain allusions. The poem, which deals with the influence of the stars on the life of man, is of an astrological character.

Manin, DANIELE (1804-57). Italian patriot. Born in Venice, May 13, 1804, of Jewish origin, he became a lawyer and associated with advanced revolutionary spirits. On the outbreak of the revolution of 1848 he was rescued by

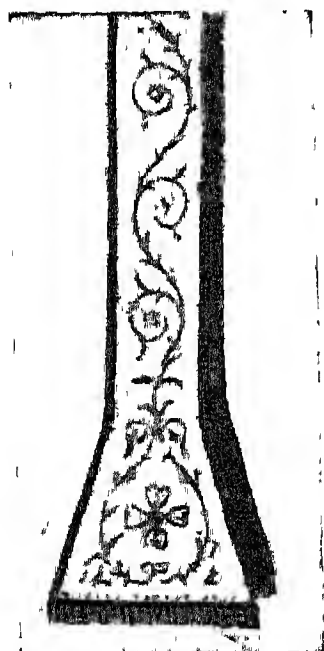
the people from prison, and elected president of the Venetian republic. When the Austrians advanced against Venice in 1849 he inspired the populace to defend the city, and only after four months' siege did Venice fall on Aug. 24. Manin was one of 40 citizens excluded from the amnesty, and he retired to exile in Paris, where, crushed by poverty and domestic sorrow, he died Sept. 22, 1857.

Man in the Iron Mask. This celebrated mystery of 17th century France is discussed under Iron Mask.

Manioc. Name sometimes given to *Manihot utilisima* from which tapioca is prepared. See Tapioca.

Maniple (Lat. *manipulus*, handful). In the Roman army, a subdivision of the legion. The 3,000 heavily armed legionaries were divided into 30 maniples, 20 of which consisted of 120, the remaining 10 of 60 men. The unit took its name from the handful or bundle of hay or straw twisted round a pole, which was adopted as its standard.

Maniple (Lat. *manipulus*). Ecclesiastical vestment of the Western Church. Originally it was a



Maniple as worn in celebrations of the Mass

narrow strip of linen shaped like a stole, and carried in the left hand of the celebrant. Now its ends are fastened together so that it can be worn securely on the left wrist. By degrees it was made of silk or velvet, and embellished with a fringe, needlework, and gold

embroidery, and even golden bells. It is represented in the Bayeux tapestry and on figures in the basilica of S. Ambrose at Milan. Abandoned by the English Church at the Reformation, it has been brought back into use. It is said to symbolise penance and sorrow.

Manipur. Centrally administered state of India. It comprises a narrow valley along the Lushai Hills, on the Burmese border. At the time of the Indian Mutiny its raja, Chandra Kirti Singh, rendered service to the British. Ultimately a British resident was stationed at the capital, Manipur or Imphal, responsible to the chief commis-

sioner of Assam. In 1891 the raja was deposed by the hill tribes under the Senaputty, and the commissioner, J. W. Quinton—who with a small force attempted to arrest the Senaputty—together with the resident, F. St. Clair Grimwood, was killed. After the massacre Mrs. Grimwood made a plucky escape under fire. A punitive expedition was sent against the Manipuris, the Senaputty was hanged, other leaders of the mutiny were transported for life, and Chura Chund was declared raja. Full administration of the state was ceded by the raja to the government of India in 1949. Area 8,620 sq. m. Pop. (1951) 579,000, more than a third belonging to animistic hill tribes.

In March, 1944, Japanese forces crossed the Burma-India frontier and invaded Manipur, driving towards the Imphal plain. Heavy fighting took place towards the end of the month on the Manipur-Chin Hills front, British and Indian troops forming "box" positions and receiving supplies by air. Early in April a Japanese column cut the Imphal-Kohima road, isolating Kohima and also threatening the supply lines of Gen. Stilwell's force making the Ledo road. Kohima was relieved on April 22, and the Japanese advance was halted, though the enemy was not cleared from Kohima until May 14. By Aug. 25 the last Japanese troops had left the state. See Burma Campaign.

Manis (Lat. *manes*, ghost). Generic name of the scaled anteaters or pangolins. They are all natives of Asia and Africa, and are so called from their nocturnal habits. See Anteater; Pangolin.

Manishtusu. King of Akkad, N. Babylonia. Successor to Rimush, and perhaps, like Rimush, a son of Sargon I. His victories are recorded in a long cuneiform inscription on an obelisk found at Susa in Persia, and on other monoliths placed in the British Museum. All Babylonia paid tribute to him, as well as 32 "sea kings" of the Persian Gulf.

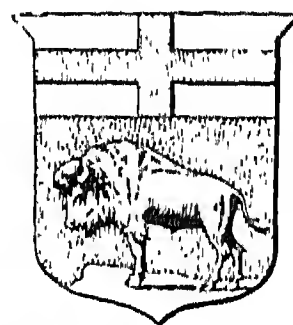
Manissa OR **MANISA.** Town of Asiatic Turkey, the ancient Magnesia ad Sipylum. It lies about 20 m. N.E. of Izmir, with which it is connected by rly., and is the junction of a branch line N. to Panderma on the Sea of Marmara. An important centre of trade, it makes cotton goods. It was the seat of the Byzantine imperial government in the 13th cent., and Murad II two centuries later made it his place of retreat after abdication.

Manissa gives its name to a vilayet with pop. (1950) of 519,319.

Manitch OR **MANYCH.** Name of a depression or river-bed in the Azov-Black Sea area of the R.S.F.S.R. It extends 425 m. from the Don to Lake Keke-Uzun 50 m. from the Caspian Sea. In spring, when the snow melts, the bed is filled with water, forming two rivers, flowing W. and E., the first into the Don. This depression, regarded by some as the boundary between Europe and Asia, is below sea level and once connected the Black Sea with the Caspian.

Manitoba. Lake of Canada. In the prov. of Manitoba, it is 60 m. W. of Lake Winnipeg, with which it is connected by the Little Saskatchewan river, also called the Dauphin, and by Lake St. Martin. It receives through the Waterhen river the waters of Lake Winnipegosis. It abounds in fish, has a length of 122 m., a breadth of 25 m., an area of 1,820 sq. m., and is at an alt. of 810 ft. The lake was discovered by a French explorer, 1739.

Manitoba. Province of Canada. Its area is 246,512 sq. m., of which 26,789 are water. It lies between



Manitoba arms

Ontario and Saskatchewan, with the U.S.A. on the S., while N. it reaches to the shores of Hudson Bay. It is watered by many rivers, one group falling into the three great lakes in the province—Winnipeg, Winnipegosis, and Manitoba. The chief rivers are the Red, which comes from the U.S.A., the Assiniboine from the W., and the Nelson, which carries the waters of Lake Winnipeg to the Hudson Bay. The most easterly of the three prairie provinces, Manitoba is one great plain. Winnipeg is the capital and the largest city.

The affairs of the prov. are controlled by a legislative assembly of one house; its 57 members are chosen for a term not exceeding five years, women being voters and also eligible for membership. There is a cabinet responsible to the legislature, while a lieutenant-governor represents the crown. Provincial affairs include education and agriculture; other departments are finance, attorney-general's, health and welfare, labour, mines, municipal affairs, and public works. The province sends six members to the federal senate and in 1953 sent 14 to the federal house of commons at Ottawa. For the town and rural districts

there is a system of local government with an elected council; some cities (e.g. Winnipeg and Brandon) are governed under special charters.

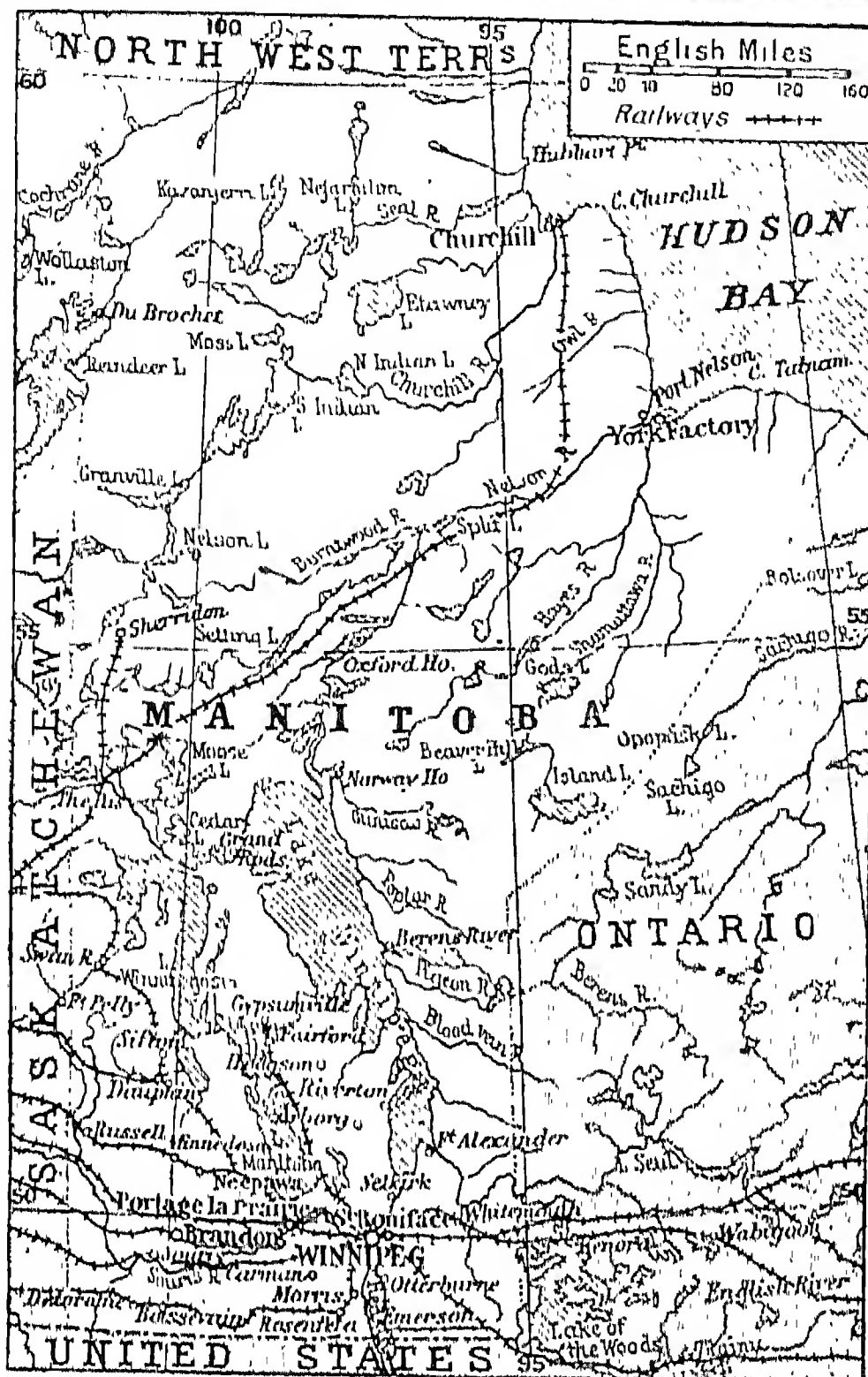
Although grain growing is of major importance, farmers also raise cattle, pigs, and sheep. Much revenue is derived from dairying, poultry, and apiaries. Sugar beet, field peas, and sunflowers are successfully cultivated. The lakes and rivers provide excellent fishing. Copper, zinc, gold, and silver are mined. The province has more than 4,000 m. of rly.; the two transcontinental lines cross it, both passing through Winnipeg.

Manitoba developed from the Red River settlement, founded 1811-12 S. of Lake Winnipeg. In the 18th century it was a region inhabited only by fur traders, but in the 19th regular colonisation began, Fort Rouge, where Winnipeg now stands, being the centre. The land was administered by the Hudson's Bay Company until 1869, when it was bought by the new dominion. In 1870 the province of Manitoba was created, in 1881 it was enlarged, and in 1912 part of the North-West Territories was added.

In May, 1950, floods inundated the valleys of the Red River and Assiniboine, causing widespread damage in the S. of the province, including Winnipeg, and rendering more than 80,000 people homeless. The pop. (1956) was 850,040; it is mixed, but c. 80 p.c. were born in Canada or the U.K. Consult *Manitoba, its Development and Opportunities*, F. H. Kitto, 1931.

Douglas L. Campbell

Manitoba, UNIVERSITY OF. Canadian university at Winnipeg. Founded in 1877 for the province of Manitoba, it was at first only an examining body. In 1900 it became a teaching body. Affiliated



Manitoba. Map of the Canadian province situated between Ontario and Saskatchewan

to it are six colleges: S. Boniface (R.C.), S. John's (Anglican), S. Paul's (R.C.), United College (United Church of Canada), Brandon College (undenominational), and Manitoba law school. The university buildings are in Winnipeg. The university has a library, laboratories, etc. In 1898 the government of the province made it a grant of 150,000 acres of land. Some 5,000 students were attending courses in 1955-56.

Manitou. In some N. American Indian religion, the god or protecting spirit of a tribe or individual, always conceived as a totem or animal spirit. The term is also used of supernatural beings with a wider sway, such as Gitché Manitou, the Great Spirit, described in Longfellow's *Hiawatha*.

Manitoulin. Group of islands in Lake Huron. Except for Drummond, which belongs to the U.S.A., they are in the prov. of Ontario. The chief are Great Manitoulin, 90 m. long, Drummond, 24 m. long, and Little Manitoulin, or Cockburn, 7 m. long. They are visited in summer for fishing and pleasure. Many of the inhabitants are Indians.

Manitowoc. City of Wisconsin, U.S.A., the co. seat of Manitowoc co. A port of entry on Lake Michigan at the mouth of the Manitowoc r., 75 m. N. of Milwaukee, it is served by the Chicago and North-Western and other rlys., and by lake steamers. Manitowoc has a good harbour and docks, and an important trade in coal and limestone. Fishing, shipbuilding, canning, and other industries are carried on. A trading post was established here in 1795. Settled about 1835, it became a city in 1870. Pop. (1950) 24,598.

Maniu, JULIUS (1873-1952). Rumanian politician. He was born Jan. 8, 1873, near Alba Julia, Transylvania. He was a member of the Hungarian parliament 1906-10, and fought for autonomous rights of the Rumanian minority. After the First Great War he organized, Dec. 1, 1918, the incorporation of Transylvania with Rumania, was elected chairman of its National party in 1919, and in 1926 merged it with the Rumanian Peasants' party in the National Zaranist party. Enthusiastically supported by the farming population in a fight against bribery and corruption, centralism, and bureaucracy, he was appointed premier in 1928. He favoured the return of Carol II, who had been forced into exile in 1926, and the king was reinstated in 1930. Forced by court intrigues to resign, Maniu served again as prime minister for a few months during 1932-33. Although bitterly disliked by Nazi Germany, Maniu survived the Second Great War, and his National Peasant party was the strongest in opposition to the post-war Russian dominated Communist govt., which in 1947 brought Maniu to trial for conspiracy; he was sentenced to solitary confinement for life. His death in 1952 was disclosed in 1955.

Manizales. Town of Colombia, S. America, capital of the dept. of Caldas. It stands at an alt. of about 7,060 ft., at the junction of the transit routes over the Andes, 73 m. S. of Medellín and 100 m. N.W. of Bogotá. It has rly. connexion with Buenaventura on the Pacific coast. A prosperous trading centre, it exports gold, coffee, and cocoa. Pop. (1951) 126,201.

Manjusri. Buddhist personage, the so-called god of wisdom in China. Apparently a central Asian culture-hero, who introduced irrigation into Nepal, he was adopted into Mahayana Buddhism as a bodhisattva or Buddha elect. In

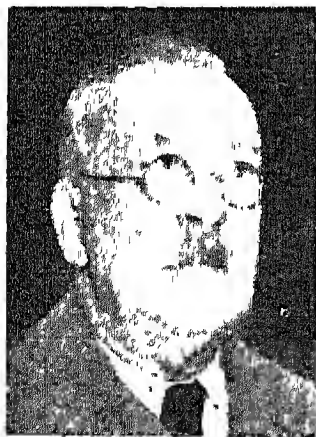
silk paintings recovered by Stein in Chinese Turkistan he is depicted riding on a lion, and is sometimes represented with sword and book in hand. On the Wutai Mt., Shansi, 5th-century temples are sacred to him; a 6th-century stone image was found at Sarnath, near Benares; and bronze statuettes have come from Tibet and Java.

Mankato. City of Minnesota, U.S.A., the co. seat of Blue Earth co. At the junction of the Blue Earth and Minnesota rivers, 85 m. S.W. of St. Paul, it is served by the Chicago, Milwaukee and St. Paul, and Pacific and other rlys. Among the industries are the manufacture of foundry and machine-shop products, knitted goods, cement, bricks, flour, and shirts. It is situated in the midst of a farming and dairying region, near quarries of limestone and cement. Settled in 1853, Mankato became a city in 1868. Pop. (1950) 18,809.

Manlius, MARCUS. Ancient Roman hero. He received the surname of Capitolinus from the fact that in 390 B.C. he frustrated an attempt of the Gauls to take the Capitol, the only part of Rome not in their possession. The cackling of the sacred geese in the temple of Juno warned Manlius and his garrison that the Gauls were endeavouring to climb the rocks upon which the Capitol stood. Champion of the plebeians, he was charged by the patricians with high treason, and condemned, whereupon he was thrown from the Tarpeian Rock.

Manly. Suburb of Sydney, New South Wales, Australia. It is beautifully situated on a peninsula forming the northern boundary of Sydney Harbour, 7 m. N. of Sydney, with which it is connected by ferry. Manly Beach, at the neck of the peninsula, is noted for its surf bathing.

Mann, HEINRICH LUDWIG (1871-1950). German novelist. Brother of Thomas Mann (*q.v.*), he was born March 27, 1871, at Lübeck. In 1933 he emigrated, to France, in 1939 to the U.S.A., eventually settling at Beverly Hills, California, where he died March 12, 1950.



Heinrich Mann,
German novelist

His novels, usually containing biting, satirical criticism of German petty-bourgeois servility, often contrasted with Renaissance

enjoyment of life, were very successful, but were often the subject of bitter controversy. The best known were Professor Unrat, 1905 (filmed, 1930, as *The Blue Angel*); and the trilogy *Die Goettinnen*, 1903. A drama of the French Revolution, *Madame Legros*, 1916, was also a considerable success.

Mann, MARY ELIZABETH (1848-1929). British novelist. Born at Norwich, Aug. 14, 1848, she began writing fiction after her marriage to Fairman Joseph Mann. She gained wide popularity with *The Patten Experiment*, 1899, and came to be known as a writer of well-characterised novels and short stories, being particularly successful in her presentation of the social atmosphere of East Anglia. She died July 14, 1929.

Mann, THOMAS (1875-1955). German-born U.S. writer. Born at Lübeck, June 6, 1875, he was one



Thomas Mann,
German-born writer

of the greatest figures in German literary life when he went to the U.S.A. in 1933. During the Nazi ascendancy he wrote and made many broadcasts against Hitler. His novels and essays were successful when he was still a schoolboy; *Buddenbrooks*, 1901, a novel of patrician life in his Hanseatic birthplace, was a best-seller. Other noteworthy books were *Royal Highness*, 1909; *Death in Venice*, 1913; *The Magic Mountain*, 1924; the trilogy, *Joseph the Provider*, 1930-34; *Lotte in Weimar*, 1940. He also wrote many essays on historical, literary, and political themes. In 1929 Mann was awarded the Nobel prize for literature. An American citizen from 1944, he did not return to Germany after the Second Great War, but in 1953 he settled in Switzerland, dying at Zürich, Aug. 12, 1955. His daughter Erica, who was born in Munich, Nov. 9, 1905, married W. H. Auden. In 1956 she published *Das Letzte Jahr*, an account of her father's final phase. It was published in an English translation, *The Last Year*, in 1958.

Mann, Tom (1856-1941). British Labour leader. Born at Foleshill, Warwickshire, April 18, 1856, he began work on a farm at the age of 7, and in a coalmine three years later, before becoming an engineer. He joined the Socialist

movement in 1885, and was a leading figure in trade union circles, taking a prominent part in the 1889 dock strike. He became secretary of the Independent



Tom Mann,
British politician

Labour party and of the National Democratic League, vice-president of the Workers' Union, and president of the International Transport Workers' Federation, but never achieved election to parliament. He was several times imprisoned, and his views became increasingly extreme; in 1935 he was acquitted at Glamorgan on a charge of sedition. He published many works on socialist themes, and his memoirs appeared in 1923. He died March 13, 1941.

Manna. Edible coagulated saccharine juice which exudes from various trees or shrubs, including the manna ash, and species of tamarisk, oak, larch, eucalyptus, etc. Another source of manna is *Alhagi maurorum*, a shrub of the family Leguminosae, native to W. Africa and S. Asia. It has oblong, undivided leaves and purple



Manna. Flower spray
of *Alhagi maurorum*

pealike flowers in sprays. The food of the Israelites in the desert, described in Ex. 16, etc., is thought by some to have been the exudation from this shrub, or more probably from *Tamarix mannifera*.

Manna Ash (*Fraxinus ornus*). Tree of the family Oleaceae, native to S. Europe. It has opposite, toothed, lance-shaped leaflets, and small, greenish-white flowers in large clusters. It is much grown in plantations in S. Italy for the production of commercial manna, used medicinally as a mild laxative. It is obtained by making incisions in the stem; the saccharine sap flows, and dries in flakes. The manna is light, porous, yellow in colour, and a valuable food.

Mannaeans OR MANNAL. Tribes of Indo-European speech. They were related to the Medes, who occupied the fertile valleys south of Lake Urmia during the 9th and

8th centuries B.C. when Assyria was extending its domination over that region. They were noted horse-breeders. In the 7th century they became vassals of the Medes, and in the 6th, by Cyrus's conquest, were incorporated in the Achaemenid empire.

Mannerheim, BARON CARL CONSTAF EMIL (1867-1951). Finnish president. The son of Count



G. C. Mannerheim,
Finnish soldier
and politician

Charles Mannerheim, he was born June 4, 1867, at Hilnes, in the co. of Åbo, Finland, and educated in the Finnish Cadet Corps at Fredrikshamn and in the Officers'

Cavalry School, St. Petersburg. He entered the Russian army and served in Manchuria, 1904-05, afterwards commanding a regiment of dragoons in Poland, and became A.D.C. to Nicholas II. During the First Great War he was in command of the Guards' brigade, and was a general at the head of a cavalry corps in 1917, when the Russian revolution broke out. He returned to Finland and raised the White Guards, which, with German assistance, defeated the Red Guards after much fighting. In 1918 the Finns formed a coalition government, and in Nov. elected him regent of Finland, but he was defeated at the presidential election held in July, 1919.

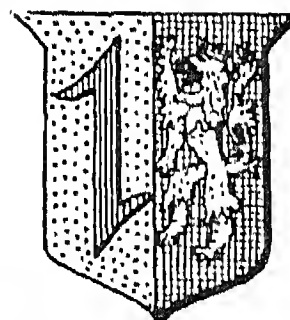
He reorganized the Finnish army and planned the Mannerheim line of fortifications across Karelia. This system of concrete forts, gun positions, machine gun posts and trenches stretched from the Gulf of Finland to Lake Ladoga, being based on the water system of the Vuoksi river. It was extended from Taipale to Sortavala, to cover the greater part of the western and northern shores of Lake Ladoga.

Promoted field-marshal 1933, he led the Finnish army in the first war with Russia, 1939-40, and was again in command in the second war, 1941-44. When, 1944, it became obvious that Finland was losing the war Mannerheim was made president, Aug. 1, and conducted the armistice negotiations with Russia. He resigned March, 1946, and died at Lausanne, Switzerland, Jan. 27, 1951.

Manners, CHARLES (1857-1935). A British singer. Born Southcote Mansergh, in London, Dec. 27,

1857, he became a bass singer after studying in Italy. He sang in Gilbert and Sullivan operas, with the Carl Rosa company, and under Augustus Harris at Covent Garden. Also a well-known choral singer, he had greatly furthered the promotion of opera in England when he died May 3, 1935. Manners married in 1900 Fanny Moody (1866-1945) who, born at Redruth, Cornwall, Nov. 23, 1866, made her début at Liverpool with the Carl Rosa in 1887. A soprano of great brilliance, she was prima donna at Covent Garden for four years. The Moody Manners opera company was founded 1897. She died July 21, 1945.

Mannheim. City of W. Germany. It is in Württemberg-Baden, at the confluence of the Rhine and the Neckar, and forms, together with Ludwigs-hafen (*q.v.*) on the W. bank of the Rhine, one of Germany's most important industrial centres and inland ports. It is



Mannheim arms

linked with this neighbouring palatinate city by two bridges—destroyed during the Second Great War, but later repaired. Mannheim, as an unimportant village, was known in 764; as a town, however, it was established in 1606 by the palatinate elector Frederick IV, and at first populated mainly by Huguenot and Dutch refugees. It was built strictly according to a plan and is therefore covered with a rectangular network of streets. Until heavily damaged by bombs, 1943-45, it contained many remnants of its 18th century rôle as electoral residency, containing a town hall, a Jesuit church, an armoury, an observatory, and a huge baroque palace with art and other galleries. Its main modern features were its industrial and commercial enterprises and the activity of its port, which dealt with more than 10,000 vessels and more than 5 million tons of goods annually. It was the home of the Daimler-Benz motor works, the leading German woodpulp and paper factories, and some of the most important chemical, rubber, wood, textile, cigar, and food industrial plants. There was also an active trade in coal, iron, and timber, though the heavy industries were mainly located outside the city. Mannheim possesses an academy of economics and law, a musical high school and many other edu-

cational establishments; it had three theatres, one of which, the National Theatre, saw the first performances of several of Schiller's plays during 1782-84. The city transferred from the jurisdiction of Bavaria to that of Baden in 1802. Mannheim was attacked by the R.F.C. during the First Great War, the raid on Christmas Eve, 1917, when one ton of bombs was dropped, being considered especially noteworthy. It was also a frequent target for Allied air forces during the Second Great War, being methodically reduced, mainly in five heavy attacks in the autumn of 1943, when many industrial targets were destroyed or heavily damaged. In 1945, owing to its position as German centre of communications on the Western front, it sustained four more heavy attacks. The city surrendered to the U.S. 7th army on Mar. 29, 1945, and became part of the U.S. occupied Württemberg-Baden state, separated from Ludwigshafen, which was in the French zone. Population (1955 estimate) 290,670.

Mannheim, KARL (1893-1947). Hungarian sociologist. Born at Budapest, March 27, 1893, and educated at the universities of Budapest, Berlin, Paris, and Heidelberg, he came to London in 1933 after he had been removed by the Nazis from the chair of sociology at Frankfurt university. He became lecturer in sociology at the London school of economics, being attached to the staff of the institute of education in 1941, and appointed to the chair of education at the institute in Dec., 1945. He made the study of education a lifelong interest, and it was to education that he turned for a solution of social and cultural problems. He died in London, Jan. 9, 1947. His many works include *Ideology and Utopia*, *Man and Society in an Age of Reconstruction*, and *Diagnosis of Our Time*.

Mannheim, LUCIE (b. 1905). German-born British actress. Born April 30, 1905, she studied for the stage in Berlin, and after appearing in Hanover, played in Shakespeare, Ibsen, and Chekhov at well-known Berlin theatres, 1924-34. She scored an immediate success on the London stage in 1935 in *Nina*. One of her most noteworthy parts was that of *Nora* in *A Doll's House*, 1939. She worked for the B.B.C. German service 1940-46, and also appeared in films.

Manning, HENRY EDWARD (1808-92). English cardinal. Born at Totteridge, July 15, 1808, he

was the son of a London banker and M.P. He was educated at Harrow and Balliol, Oxford. In 1832 he was made fellow of Merton, Oxford, and having been ordained was in 1834 given the rectory of Lavington, Sussex, being then an adherent of the Oxford movement. Having gained considerable note as a preacher, he was made in 1840 archdeacon of Chichester. He had married in 1833 Caroline Sargent (d. 1837), thus *Hanny & Carl Archbp* becoming related to Samuel Wilberforce. In 1838 he visited Rome in Gladstone's company and there met Cardinal Wiseman.



Manning went over to the Church of Rome in 1851 and after a short period of retirement was ordained. In 1857 he founded the London congregation of the Oblates of S. Charles at Bayswater, and became its superior, acting also as assistant to Wiseman. On the latter's death in 1865 he became archbishop of Westminster. He was made a cardinal in 1875. Active to the last, he died Jan. 14, 1892. He is buried under the high altar in Westminster cathedral.

Manning was a man of ascetic life, and an untiring worker. He was a supporter of the temperance movement, and had a real sympathy with the labouring classes, evidenced by his share in settling the dock strike in 1889, and by his presence on the royal commission on housing. On the other hand he was intolerant, while he showed a certain lack of scruple in seeking his ends and in securing advantages for his Church. Towards the papacy he adopted a strong ultra-montane attitude, in contrast to the Gallican position of most of the R.C. families in England. But the outstanding fact of his life is the enhanced position which his labours and personality secured for the R.C. Church in England. He figures in Beaconsfield's *Lothair* as Cardinal Grandison. He wrote *The Temporal Mission of the Holy Ghost*, 1865; *The Eternal Priesthood*, 1883. Consult *Lives*, A. W. Hutton, 1892; F. A. Gasquet, 1895; Shane Leslie, 1921.

Mannings, THE. Husband and wife, executed for the murder of

Patrick O'Connor, on Aug. 9, 1849. O'Connor was a former lover of the wife, Maria Manning, and the relationship was continued after the marriage, and condoned by Manning. The pair plotted finally to obtain O'Connor's money, and the story of their cold-blooded conspiracy has become a classic in criminal literature. They invited O'Connor to a dinner of roast goose, killed him on his arrival in the house, flung his body into the already prepared grave under the flags of the kitchen floor, and then ate a hearty meal while discussing their next steps. Mrs. Manning went to the lodgings of her victim and ransacked them for valuables, while her husband covered the dead man with lime. The two were tracked down through a friend of O'Connor's knowing of his intrigue with Maria Manning, and were hanged at Horsemonger Lane Gaol, Nov. 13, 1849, the woman in a black satin dress. The execution was witnessed by Dickens, who wrote a remarkable and moving letter to *The Times* on the horrors of public executions.

Manningtree. Parish and market town of Essex, England, on the estuary of the Stour, 8 m. N.E. of Colchester. A rly. junction, it has a trade in wheat and malt; malting is the chief industry. The principal buildings are the church of S. Michael and the public hall. The town is a good centre for the Constable country in Suffolk, East Bergholt, where the artist was born, being 3 m. away. Pop. (1951) parish, 619.

Mannite OR MANNITOL. Sweet substance discovered by Proust in 1806, prepared from manna, the dried exudation from various species of the ash tree. Mannite occurs also in other vegetable substances, e.g. celery roots and larch sap, and is also formed in the lactic and viscous fermentation of sugar.

Mannock, EDWARD (d. 1918). British airman. During the First Great War he joined the air force from the Royal Engineers, being awarded the M.C. and bar, and the D.S.O. and two bars. He was brought down in flames over the German lines and killed, July 26, 1918, by which date he had accounted for 50 German aeroplanes. A major, he was posthumously awarded the V.C.

Manns, SIR AUGUST FREDERICK (1825-1907). German-born British conductor. Born at Stolzenberg, near Stettin, March 12, 1825, he learned to play several instruments as a boy. At Elbing he was in the town orchestra, and later

belonged to a regimental band at Danzig; he conducted the music at Kroll's Garden, Berlin, and was bandmaster at Cologne and Königsberg. In 1854 Manns settled in London as assistant conductor at the Crystal Palace, becoming conductor in 1855. He raised the music there to a high pitch of excellence, and by his generous encouragement of British composers exercised a powerful influence on musical progress in England. During 1883-1900 he officiated at the Handel Festivals. Having become a naturalised British subject, Manns was knighted in 1903. He died March 1, 1907.

Manny, SIR WALTER DE (d. 1372). English soldier. Born in Hainault, he was originally named Mauny, and his father had been a soldier in the English service. He came to England in the train of Philippa of Hainault, wife of Edward III, in 1327, and soon made a reputation as a fighter. He served with distinction in Edward's French wars; in 1337 he led a raid on the island of Cadzand and was in command of other expeditions. He was made a baron in 1347 and K.G. in 1359. Manny helped to found the Charterhouse. His wife, Margaret, a granddaughter of Edward I, was made duchess of Norfolk.

Mannyng, ROBERT (c. 1264-c. 1340). An English chronicler. Known also as Robert of Brunne, now Bourne in Lincolnshire, he became a monk and spent most of his life in monasteries in that county. His principal work is the poem *Handling Synne*, a free translation of the *Manuel des Pechiez* of William of Waddington, which was a valuable and quaint commentary on early English life. He also wrote *The Story of Inglande*, which traces the descent of a king of Britain to Aeneas, describes the Trojan War, and includes a close version of Wace's *Brut d'Angleterre*. This work had great effect upon the language in its rejection of Teutonic and adoption of French words.

Manod. Quarry, near Blaenau Festiniog, Merioneth, Wales. During the Second Great War the extensive workings of this quarry were fitted with air-conditioned brick chambers, in which were housed the pictures removed for safety from the National Gallery.

Manoel. Name of two kings of Portugal. Manoel I, king from 1495 to 1521, is known as the Fortunate. He sent out Vasco da Gama and other explorers, and did much for literature and art.

Manoel II (1889–1932) was born in Lisbon, Nov. 15, 1889, the second son of King Carlos I. He was made duke of Beja, and succeeded to the throne Feb. 1, 1908, on the murder of his father and elder brother. In Oct., 1910, when the republic was established, he took refuge in England, staying first with his mother's brother, the duke of Orleans, at Wood Norton, near Evesham, Worcestershire, and later settling at Twickenham. There he devoted himself to a life of culture, and made a reputation as a musician, a bibliophile—he was the leading private collector of works of the Portuguese renaissance—a historian, and a patron of athletics and the arts. In 1913 he married Princess Augusta Victoria of Hohenzollern-Sigmaringen. There were several abortive attempts to restore him to the throne. For political reasons his offer to serve in the British army in the First Great War could not be accepted. He died July 2, 1932, leaving no children.

Manoeuvres. Large-scale exercises carried out by the fighting forces to train leaders and test methods of war. Military manoeuvres were introduced by Frederick the Great in the Prussian army in 1753 and adopted by most other Continental countries after the Napoleonic wars; after 1870 they were everywhere greatly influenced by German practice. The available force was generally divided into two parts, and directed to engage in operations in accordance with a given plan. Manoeuvres were held at the end of the year's military training, after the harvest, to avoid damage to crops. They were introduced in England in 1898.

Naval manoeuvres are exercises carried out at sea on similar lines. First introduced in the British navy in 1885, they were generally held every summer. Air manoeuvres were held after the establishment of the air force as a separate arm. The term manoeuvres has now been officially discarded in favour of fleet exercises, combined exercises, etc.

A vital principle of manoeuvres is that the intended war-time leaders should be engaged in them, so as to learn the capacity of the forces they will command in the event of war. The weakness of peace-time manoeuvres lies in the necessity of avoiding damage and casualties. Although valuable lessons can be learned, given sufficiently high quality in the directing staff, it is notable that

the conclusions drawn have been as often wrong as right, and as often disregarded as not. In 1913, for instance, two fleets representing in strength approximately the British and the German met in an exercise; after an indecisive engagement the weaker fleet succeeded in getting away. Had the proper deductions been made, the German fleet might not have escaped after the battle of Jutland (*q.v.*). On land, again, the Allies in 1940 were at fault over the value of such systems as the Maginot line, and over the relative effectiveness of armour and armour-piercing weapons; problems which the Germans had solved correctly by using the Spanish civil war as a testing-ground. The Germans had used a proportion of live ammunition in manoeuvres, both in small arms and artillery, before the Second Great War; and its use was adopted by the British in some of their large-scale exercises between 1941 and 1944. The death-rolls and material damage arising would of course be out of question in peace-time; but the lessons were powerfully brought home.

Manoeuvres in war are the tactical or strategical moves by which an enemy is attacked, or his attack countered. To render a manoeuvre successful, a commander requires a combination of surprise and of local superiority over the enemy.

Man-of-War Bird. Popular name for the frigate bird (*q.v.*), and also given to the albatross.

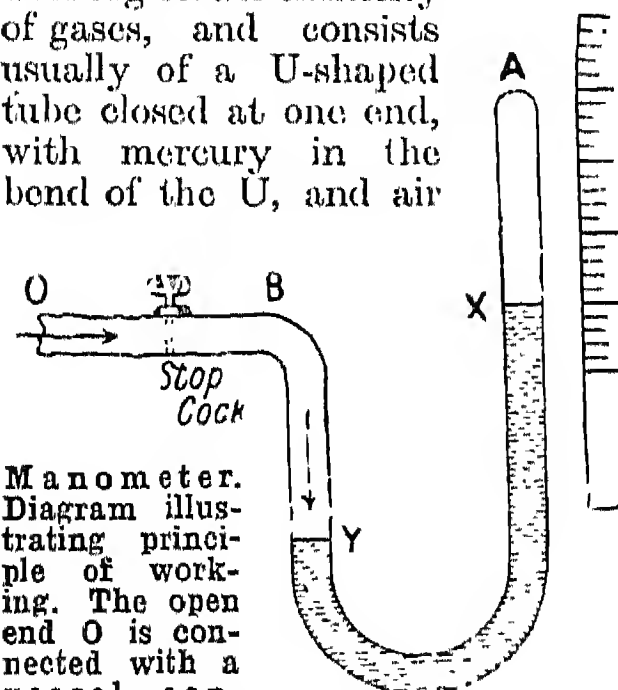
Manometer (Gr. *manos*, rare; *metron*, measure). Instrument for measuring the pressure or density of a gas. The simplest form of manometer is the barometer, which measures atmospheric pressures. The ordinary form of the instrument depends for its principles of working on the elasticity of gases, and consists usually of a U-shaped tube closed at one end, with mercury in the bend of the U, and air

in the closed limb. In the figure the open end O is connected with the vessel containing the gas the pressure of which is to be measured. If the pressure is greater than that of the atmosphere, the mercury is forced up the closed end of the tube, and by means of a graduated scale the pressure exerted by the gas is known. Another form of manometer is typified in the steam gauge. Here a piston is moved by the pressure of the steam and operates an indicator controlled by a spring. *See also* Pressure Gauge.

Manon. Heroine of Manon Lescaut, romance by Abbé Prévost. Three operas have been founded on her story: by Auber, to a libretto by Scribe, first produced Paris, 1856; by Massenet, to a libretto by Meilhac and Gille, first produced Paris, 1884, and by the Carl Rosa co., Liverpool, 1885; and by Puccini (Manon Lescaut) to an anonymous libretto, first produced Turin, 1893, and Covent Garden, 1894.

Manor. Name given in England from the 11th century to an estate of a certain kind. The system was also found in France, Germany, and other parts of Europe where feudalism prevailed, and something akin to it elsewhere. The origin of the manor has given rise to discussion. A Roman parentage has been claimed for it, but others think it originated in the free village community of the Teutons. F. W. Maitland has put forward the theory that the manor was primarily a house or estate which was assessed separately for the geld, or taxes, of Norman times. This, he thinks, explains not only the variations in the size of the manors, but solves other difficulties. Others, however, think this explanation too narrow, and describe a manor as "a complex of rights over lands and tenements."

As revealed in Domesday Book and later authorities, the manors in England varied very much in size and in other ways, but certain features appear to have been common to all. Each had a lord and tenants called villeins, who owed him certain duties, and on each the land was divided into the demesne, or holding of the lord, the arable and meadow in which the villeins had also a share, and certain woods and commons. The arable was divided into strips, each tenant having an equal number. The villeins paid certain dues to the lord, and, moreover, were bound to work for him for a certain number of days in the week or



Manometer. Diagram illustrating principle of working. The open end O is connected with a vessel containing gas, allowed to flow into the U-tube B A by a stop-cock. X and Y are the mercury levels, X A imprisoned air. *See* explanation in text



Manor House at West Hoathly, Sussex. An example of the Tudor manor house of the late 16th century
By courtesy of Country Life, Ltd

year. In addition to the villeins there were on many manors a poorer class of tenants called cotters, or bondars. All were in a sense unfree, but the villeins had certain rights in their holdings which were recognized by the law. Other classes of tenants appear in various parts of England, especially socmen, probably freemen who held land on condition of service to the lord of the manor.

A feature of the manor was the manorial courts. These exercised a little criminal jurisdiction, but they were mainly occupied with civil business concerned with the manorial holdings, and from the records which they kept comes the term copyhold. The chief officials of the manor were the steward, who presided over the courts, the bailiff, who managed the lord's own property, and the reeve, chosen by the tenants to look after their interests.

Before the end of the Middle Ages the system began to decay. The villeins were attracted to towns, wherein residence for a year and a day made them freemen. Courts, copyholds, and other vestiges of the system survived into the 20th century, but the Law of Property Act, 1922, provided for their extinction. See Copyhold; Feudalism; Villeinage; consult Domesday Book and Beyond, F. W. Maitland, 1897; Growth of the Manor, P. Vinogradoff, 1905.

Manor House. In feudal times, the residence of the lord of the manor and his retinue. The hall was the most important chamber, and in addition to this were the solar, i.e. the lord's private chamber, the kitchen, servery or general service room, larder, and buttery. During the 13th century windows began to be glazed. The hall continued for some centuries to be the principal apartment; but the solar was enlarged and used as a "with-

drawing room" (hence drawing-room), bedrooms and sitting-rooms were added, and the family living-rooms were separated from the servants' quarters and offices.

The plan consisted of a hall, with family apartments on one side, and offices at the other; or the rooms were grouped round a court. Larger manor houses of the late

16th century are generally tri-lateral in plan. The hall became less important as retinues grew smaller. Towards the end of the 16th century, a separate dining-room for the family became usual. After Elizabeth's reign the manor house loses its distinctive architectural character.

Manor Park. Parish and residential district of Greater London, in the co. of Essex, England. Lying between Forest Gate and Ilford, with a rly. station, the eccles. parish was formed from that of Little Ilford in 1901. The church of S. Barnabas was consecrated in 1900. Here are Manor Park and the City of London cemeteries. The name of Manor Park is given also to districts of Lee, S.E., and elsewhere.

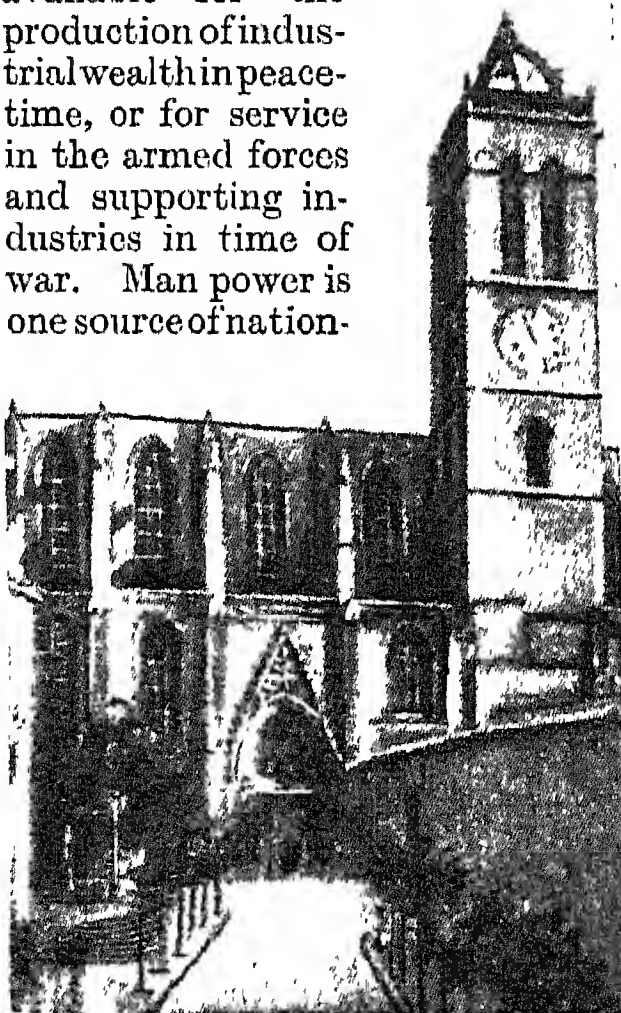
Man Power. Term used to denote the proportion of a nation's adult population available for the production of industrial wealth in peacetime, or for service in the armed forces and supporting industries in time of war. Man power is one source of nation-

al wealth, greater in the case of an industrialised nation. Thus, the man power of Great Britain's pop. of less than 50,000,000 is a source of greater national wealth than that of the sub-continent of India, which exceeds 400,000,000. Similarly, a highly industrialised country like the U.S.A. is richer in the man power available from its pop. of 130,000,000 than is the U.S.S.R. with a pop. of 193,000,000.

In time of war the allocation of man power in such proportion that the maximum numbers can be drafted into the fighting services, while ensuring that sufficient workers are retained in industry to supply the fighting services, is one of the most difficult administrative problems. In the Second Great War the democracies were obliged to follow the example of the dictatorships and direct the adult population to the services or industries in which their labour could best be employed. In the U.K., by the Emergency Powers (Defence) Act of May, 1940, the ministry of Labour was given authority to mobilise man power and direct it into the channels most likely to increase the efficiency of the war effort. At one time a nation's strength in man power was judged by the number of troops it was able to put in the field, but in modern warfare only a comparatively small proportion of the population is available for the fighting services. Between the years 1939 and 1945 only 4,542,000 men and women were available for the fighting services out of a pop. of 50,000,000; all other adults capable of working were required to supply civil and warlike needs.

After the Second Great War, Great Britain's lack of dollar exchange demanded the maximum export of manufactured goods in order to gain exchange for the import of food and raw materials. Hence, in 1947-50 the govt. again took powers to direct man power, this time into industries making goods for export, thus preventing shortage of man power in many industries, especially coalmining and textile production.

Manresa (anc. Munorisa). Town of Spain, in the prov. of Barcelona. It stands on the river Cardener, spanned by Roman and modern bridges, 40 m. by rly. N.N.W. of Barcelona. It has a beautiful Gothic church, a church built over the grotto associated with Loyola's visions, and a Dominican monastery. A busy rly. junction, it manufactures cotton, woollen, and silken goods, chemicals, etc. Pop.

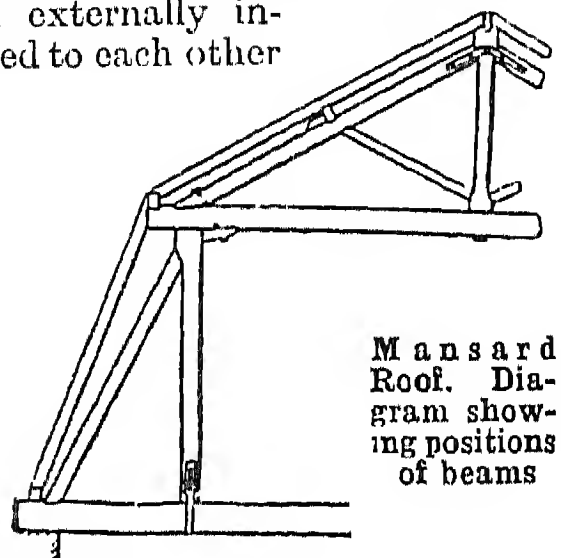


Manresa, Spain. Main entrance of the cathedral of Our Lady of Dawn

(1950) 40,452. During the Spanish Civil War, Manresa was captured by the Nationalist forces of Gen. Franco, Jan. 23, 1939, during their advance on Barcelona.

Manrique, JORGE (1440-78). Spanish lyrical writer. Son of the count de Paredes, he was a member of a family of poets and soldiers. His Coplas (Couplets) brought him fame and were translated by Longfellow.

Mansard. Type of roof named after François Mansart (*v.i.*). It consists of four planes hinging on and externally inclined to each other



at an angle wide enough to provide ample room space within its limits, and generally fitted with dormer windows. Structurally inadequate in its simplest forms, it has to be strengthened by tie beams. It was abundantly employed in French neo-classic architecture of the 17th century, and has since been used for large buildings in England and Germany where space and external artistic effect are important. The roof may be trussed or untrussed.

Mansart OR **MANSARD, FRANÇOIS** (1598-1666). French architect. Born in Paris, he was commissioned by the duke of Orleans in 1635 to design the rebuilding of the château at Blois, and in 1642 undertook the famous Maison (now Maison-Lafitte) for René de Longueil. His greatest work was the monastery of Val de Grâce, Paris, (1648), in the execution of which he was superseded by Richelieu's favourite, Lemer cier.

Mansart, JULES HARDOUIN (1646-1708). French architect. Born in Paris, nephew and pupil of François Mansart, he became, in 1675, the principal architect of Louis XIV, his most important work being the palace of Versailles (1678-1708). His other buildings included the château of Clagny for Mme. de Montespan (1676), the dome of the Invalides (1693), the château of Marly (1683), the façade of the town hall at Lyons, and the Place Louis-le-Grand, Paris. He was made a count, and died suddenly at Marly.

Mansbridge, ALBERT (1876-1952). British educationist. Born at Gloucester, Jan. 10, 1876, and educated at elementary schools and Battersea grammar school, he was founder of the Workers' Educational Association in England, 1903, and a member of government committees on education, including the consultative committee of the board of Education, 1906-12 and 1924-39. He was expert adviser to the British and Australian army education services, 1918-1919, and lecturer on the Lowell foundation, Boston, U.S.A., 1922 and 1934. He was created C.H., 1931. His books included *An Adventure in Working Class Education*, 1920; *Talbot and Gore*, 1935; *The Kingdom of the Mind*, 1944. He died Aug. 22, 1952.

Manse (medieval Lat. *mansa*, dwelling). General name for the dwelling-house of a Scottish minister. Originally the house of a landowner with the land attached, the term was later restricted to the house and land attached to churches of the established church of Scotland. The duty of providing and maintaining the manse in repair rests upon the landed proprietors of the parish, though if they can get it declared a free manse the incumbent must do the repairs after the first 15 years. The term is also occasionally applied to the dwelling-house of a minister of any Free Church in England and the U.S.A., more particularly if it is the property of the church.

Mansel, HENRY LONGUEVILLE (1820-71). British philosopher and divine. Born at Cosgrove, Northamptonshire, Oct. 6, 1820, he was educated at the Merchant Taylors' School, London, and S. John's College, Oxford. He became fellow and tutor of S. John's in 1843, but was transferred in 1855 to Magdalen as reader in philosophy. In 1859 he was made Waynflete professor of philosophy, and in 1867 professor of ecclesiastical history. From 1868 until his death, July 30, 1871, he was dean of S. Paul's. In his philosophical writings Mansel was in the main a supporter of Sir W. Hamilton, but he was also influenced by the older

Scottish school and by Kant. He adopted the theory of the relativity of knowledge; external perception provides us with appearances only. He was hostile to the idealism of Hegel, then making way at Oxford. His works include *Prolegomena Logica*, 1851; *Metaphysics*, 1860; and *The Gnostic Heresies*, 1875.

Mansfeld, ERNST, COUNT VON (c. 1580-1626). German soldier. He was illegitimate son of Peter, prince von Mansfeld, governor of Luxemburg, where he was born.



Count Ernst von Mansfeld, German soldier After Van Dyck

He served first in the imperial army against the Turks in Hungary, but afterwards joined the emperor's foes. When the Thirty Years' War began, Mansfeld, known as an

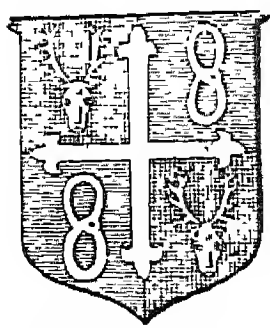
able soldier, was given a command to help the Bohemians. He fought with varying success for Frederick, elector palatine, against Tilly, but his troops were as harmful to their friends as to their foes, for Mansfeld was one of the worst of the mercenary leaders of that time. He took a command under the Dutch government, but is better known as the leader of the force sent by James I to restore the king's son-in-law, Frederick, to his electorate in Germany. This failed, and, after a defeat at the hands of Wallenstein, Mansfeld died in Bosnia. Nov. 29, 1626. The family of Mansfeld, known in Germany, mainly for the military prowess of its members, for about seven centuries, became extinct about the year 1780.

Mansfield. Mun. borough and market town of Notts, England. It stands on the Maun, 139 m.



Mansfield, Nottinghamshire. Old parish church of S. Peter from the south-east

Valentine



Mansfield arms

from London and 13 m. N. of Nottingham, with which it has rly. connexions. The chief buildings are S. Peter's church, a fine old edifice, S. John's church, a fine modern one, the town hall, and the grammar school, founded in the 16th century. There are manufactures of hosiery, shoes, machinery, textile fabrics, decorated tin ware, etc., while around are coal mines, to the opening of which is due the rapid growth of the town since about 1890. On the edge of Sherwood Forest, in early times a royal hunting ground, Mansfield was often visited by royalty. To the S.W. is the King's Mill, associated with the story of the miller of Mansfield and Henry II. Mansfield became a borough in 1891, and gives its name to a county constituency. It has a museum and art gallery. Market days, Mon., Thurs., and Sat. Pop. (1951) 51,352.

Mansfield. City of Ohio, U.S.A., the co. seat of Richland co. It is 66 m. S.W. of Cleveland, and is served by the Pennsylvania and other rlys. and an airport. An important industrial centre, it contains factories manufacturing electrical appliances, sheet steel and tinplate, and farming machinery. Settled in 1808, it was incorporated in 1828 and became a city. Pop. (1950) 43,564.

Mansfield, EARL OF. British title borne since 1776 by the family of Murray. The first holder was the lawyer, William Murray. He left no sons, but by special remainder was succeeded by his nephew, David Murray, 7th Viscount Stormont (1727-96). This Scottish title dates from 1621, when it was given by James I to Sir David Murray. The 2nd earl was in turn an ambassador to Austria and to France, a secretary of state, and a lord president of the council. The earldom is still held by his descendant, Mungo David Malcolm Murray (b. Aug. 9, 1900), becoming 7th earl in 1935. He had been M.P. for Perth, 1931-35, served on various government commissions and was well known as an ornithologist. The earl's chief seat is Scone Palace, near Perth, and his eldest son is known as Lord Scone.

Mansfield, WILLIAM MURRAY, EARL OF (1705-93). English judge. A son of the 5th Lord Stormont, he was born at Scone, near Perth, March 2, 1705, and educated at

Westminster and Christ Church, Oxford. Called to the bar in 1730, he became M.P. for Borough-



Mansfield
After Reynolds

bridge and solicitor-general, 1743; attorney-general, 1754; and lord chief justice, 1756. He held office in the duke of Newcastle's cabinet and was one of the weightiest and most eloquent Tory leaders in the House of Lords, although he refused to be distracted by politics from his judicial career. His decisions on commercial law were important, but his legal learning has been questioned. As a poli-

tician he was fiercely attacked by Junius, and incurred odium by his falsely alleged bias in conducting the trial of that writer's printers and publishers. He gave the famous decision that slaves are free when they land in England. Owing to his support of the R.C. relief bill in 1778, his house in Bloomsbury was burnt by the Gordon rioters in 1780. Having received an earldom in 1776, Mansfield retired from the bench in 1788, and died March 20, 1793. See Ken Wood. *Consult Life*, C. H. S. Fifoot, 1936.

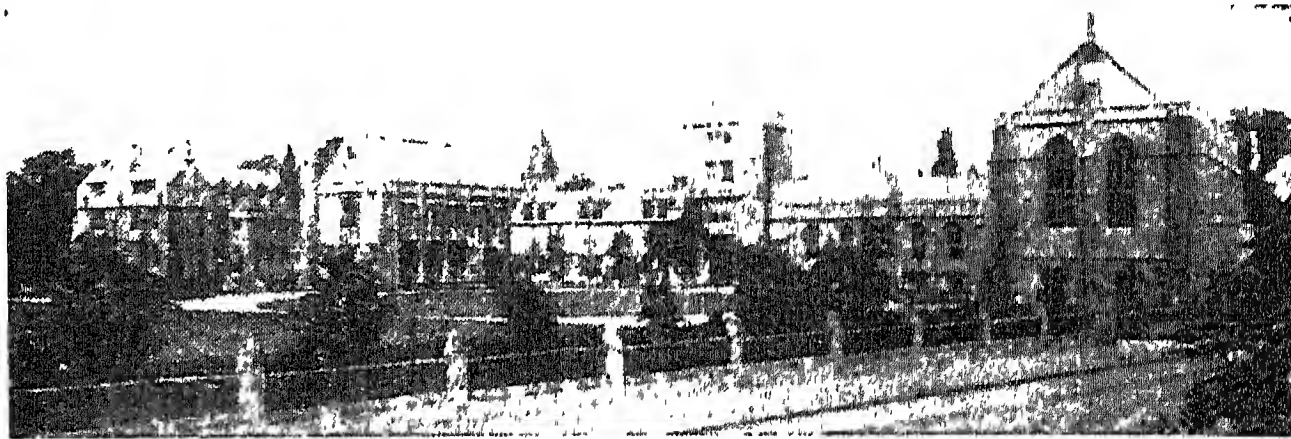
Mansfield, KATHERINE (1890-1923). New Zealand-born British writer. Born at Wellington, N.Z., she came to England as a child, and settled in London. In 1913 she married J. Middleton Murry (q.v.) with whom she was associated in the publication of the review *Rhythm*, and contributed leading articles to *The Athenaeum* under her husband's editorship.



Katherine Mansfield, British writer

In 1911 she published her first collection of short stories, *In A German Pension*. Much influenced by Chekhov, she established the intellectual position of the contemporary short story in English literature. Later collections included *Bliss*, 1920; *The Garden Party*, 1922; *The Dove's Nest*, and *Poems*, 1923; and a posthumous volume *Something Childish*. She died at Fontainebleau, Jan. 9, 1923. Her journal appeared in 1927; her letters in 1928; collected stories in 1946. *A Life* by R. E. Mantz and J. M. Murry was published in 1933.

Mansfield College. Permanent private hall of the University of Oxford which receives undergraduates for tuition in any school, and graduates for training in theology. Dating from 1886, it derived from Spring Hill College,



Mansfield College, Oxford. Front of college buildings, with the chapel forming the wing on the right
Frith

Birmingham, founded 1838 as a Congregational training college by George Storer Mansfield, his sister, and others. The college buildings, opened in 1889 as a non-residential postgraduate theological college, were in 1946 converted to accommodate 28 resident students. Mansfield college was granted the status of a permanent private hall of the university in 1955.

Mansfield Park. Novel by Jane Austen. Published anonymously in 1814, it is notable for its admirably drawn scenes of English country society and the lifelike characters of Mrs. Norris, Henry and Mary Crawford, and the Price family. The scene is set principally in Northants where, at Mansfield Park, the heroine Fanny Price lives with her uncle and aunt, Sir Thomas and Lady Bertram. Of greater maturity than *Pride and Prejudice*, this novel ranks with *Persuasion* in its restraint and depth of observation.

Mansfield Woodhouse. Urban dist. of Notts, England. It is 2 m. N. of Mansfield, with a rly. station. It is in a coal mining district, while limestone and sandstone are also worked. Pop. (1951) 17,821.

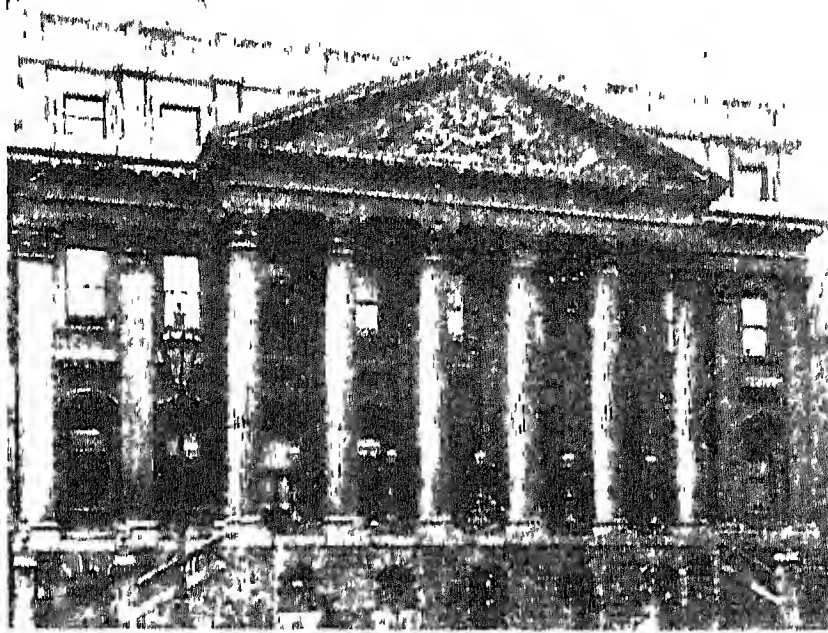
Mansion House. Name given to the official residence of the lord mayor of London, and also applied to other buildings of the kind. It stands opposite the Bank of England in the heart of the city. The foundation stone was laid Oct. 25, 1739, but the building, designed by George Dance the elder, was not finished till 1753. The front façade is screened by a portico of six fluted Corinthian columns, the pediment enclosing a design by Sir Robert Taylor, in high relief, of a female figure crowned with turrets, symbolising the city of London. The building is of Portland stone. The principal apartment is the Egyptian Hall, designed by the earl of Burlington after Vitruvius, 90 ft. by 60 ft., where banquets and various functions are held. Corinthian columns support the roof of this room, which is gorgeously decorated. The city police court is on the first floor.

There is also a Mansion House in Dublin, the official residence of the lord mayor since 1715. This is in Dawson Street, and contains the Round Room, built in honour of George III, and still the largest meeting place in the city. Here was held the first session of Dáil Éireann; here was signed the Anglo-Irish treaty of 1921.

Manslaughter. Term used in English law. It means unlawfully slaying another without malice aforethought. Manslaughter may be almost an accident, or very nearly a murder, or any homicide between those two. Thus, to kill a man upon great provocation, "upon a sudden heat," is manslaughter removed from murder only by the fact of the provocation. If the driver of a vehicle drives with such negligence that a jury finds his negligence criminal, and runs over and kills someone, he also is guilty of manslaughter, though he had no intention of harming the person slain. Manslaughter is a felony; and its maximum punishment is imprisonment for life. See Murder.

Manson, JAMES BOLIVAR (1879-1945). British art critic and painter. Born in London, June 26, 1879, he was educated at Dulwich, and studied art at Heatherley's, Lambeth art school, and Julian's, Paris. On the foundation of the London Group (*q.v.*) he became its secretary. Assistant keeper at the Tate Gallery, 1917-30, he was then di-

rector until 1938. Chiefly with portraits and landscapes, he exhibited at the New English art club and



Mansion House, London. Front façade of the lord mayor's official residence

the London Group, and is represented at the Tate by Michaelmas Daisies, purchased in 1923. His publications included studies of Rembrandt (1923) and Degas. He died July 3, 1945.

Manson, SIR PATRICK (1844-1922). British physician. Born Oct. 3, 1844, at Fingask, Aberdeenshire, he took his medical degree at Aberdeen University. He specialised in parasitology and became physician and medical adviser to the Colonial office. He was the first to suggest that the malarial parasite was carried by the mosquito, which theory was established by experiment as correct by 1900. He published Goulstonian Lectures, 1896; Tropical Diseases, 1898. Manson, who was F.R.S., was knighted in 1903, and died April 9, 1922. See Malaria; Ross, Sir R.; consult Life, P. Manson-Bahr and A. Alcock, 1927.

Manson-Bahr, SIR PHILIP (b. 1881). British physician, educated and trained at Rugby, Cambridge university, and London Hospital. He married the daughter of the above Sir Patrick Manson, and added her surname to his own. Specialising in tropical medicine, he was in charge of research expeditions to Fiji, 1909, and Ceylon, 1912. Consulting physician to the Colonial office from 1929, he was a director of the clinical division of the London school of hygiene and tropical medicine and senior physician at the hospital for tropical diseases. He contributed the article on malaria to this Encyclopedia. He was knighted in 1941.

Manstein, FRITZ ERICH VON (b. 1887). German soldier. Twelfth child in an E. German military family named von Lewinski, he was adopted soon after birth by relatives named von Manstein. Becoming a soldier, he was chief

of staff to Rundstedt in Poland during Sept.-Oct., 1939. He captured Sevastopol July 3, 1942, being promoted F.M. on July 1. Commanding in the Ukraine in 1943, he was responsible, Nov.-Dec., for the only serious setback the Russians encountered in reconquering their country. Removed from the command in S. Russia in April, 1944, he was arrested at a hospital in Schleswig-Holstein Aug. 31, 1945, and taken to England. He testified for the German high command and general staff before the Nuremberg tribunal, Aug. 9, 1946. He was released from a p.o.w. hospital at Diss, Norfolk, in July, 1949; but Polish and Russian accusations that he was a war criminal led to his trial before a British military court at Hamburg where he was condemned in Dec. to 18 (reduced later to 12) years' imprisonment, chiefly for allowing the killing of hostages. He was released on the expiry of his sentence (less remission for good conduct) May 7, 1953.

Manston. R.A.F. station in Kent, England, on the coast 2½ m. S.W. of Margate. Opened during the First Great War as a R.N.A.S. training centre, converted later into a training centre for R.A.F. flight mechanics and armourers, during the Second Great War it was an advanced base of No. 11 fighter group, and in Aug., 1940, was put out of action for some weeks. It had air raid shelters 80 ft. below ground in tunnels made by German prisoners in 1917-18 as ammunition stores. The aerodrome covers 1,400 acres, and after the Second Great War passed to R.A.F. transport command.

Mansura OR EL MANSURA. City of Lower Egypt. Situated at the junction of the Damietta branch of the Nile and a canal which goes to Lake Manzala, it is a flourishing commercial town and the centre of a large cotton growing district. Here is the old fortress of S. Louis of France, recently restored, where he was imprisoned in 1250. Near are the ruins of the temple of Isis. Pop. 102,000.

Manta. Coastal town of Ecuador, in Manabi prov. On the S. of Manta Bay, it is a port for cacao, coffee, fruit, ivory, nuts, and the Jipijapa (so-called Panama) hats. Pop. (est.) 19,000.

Mantallini, ALFRED. Character in Dickens's novel Nicholas Nickleby. An amorous dandy, he spends the money of his wife, a fashionable London mantua maker, until his extravagance brings them both



Mantegna. One of nine frescoes illustrating The Triumph of Caesar, by Andrea Mantegna ; painted 1484-90, they are now in Hampton Court Palace

to poverty. His speech is as extravagant as his habits: inconsequential and sprinkled with "dem" and "demd," it helps to make him one of the author's most memorable and entertaining grotesques.

Mantaro. River of central Peru. Rising in the prov. of Junin, it drains L. Junin (or Chinchaycocha) and flows S.E. into Huancaavelica. It breaks through the Andes and, turning N.E., joins the Apurimac, the united stream forming the Ené. Length about 280 m.

Mantegna, ANDREA (1431-1506). Italian painter. Born at Vicenza, he was adopted by Squarcione, and painted an altar-piece, The Madonna in Glory, for S. Sofia, Padua, 1448. He came early under the influence of Donatello, married the daughter of Jacopo Bellini, decorated the Eremitani church at Padua, 1450-59, and painted a triptych, The Madonna Enthroned, for the church of S. Zeno, Verona. By 1455 he was virtually chief of the Paduan school, and had painted his fine Agony in the Garden, now



Andrea Mantegna, Italian painter

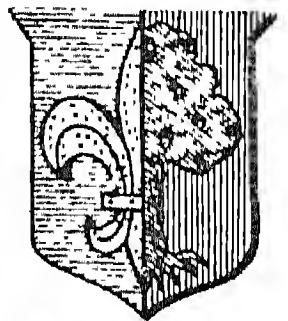
in the National Gallery, London. Invited to Mantua by the marquis, Lodovico Gonzaga, about 1460, he painted the triptych, The Adoration of the Magi, for the chapel of the old castle in that city. His great series of nine pictures, The Triumph of Julius Caesar, in Hampton Court Palace, was executed 1484-90. In 1488, at the request of the pope, Mantegna decorated the Belvedere chapel in the Vatican with frescoes. He painted the Madonna della Vittoria, now in the Louvre, about 1495.

Mantegna, who died Sept. 13, 1506, was one of the greatest Italian painters, and his influence was immense. His style, formed on the antique, is severe and statuesque. Most of his decorations, painted on dry plaster, have decayed. His easel pictures were mostly executed in tempera. An expert engraver, he introduced to Mantua the art of engraving on copper with the burin. There are Lives by P. Kristeller and P. Yriarte, both 1901.

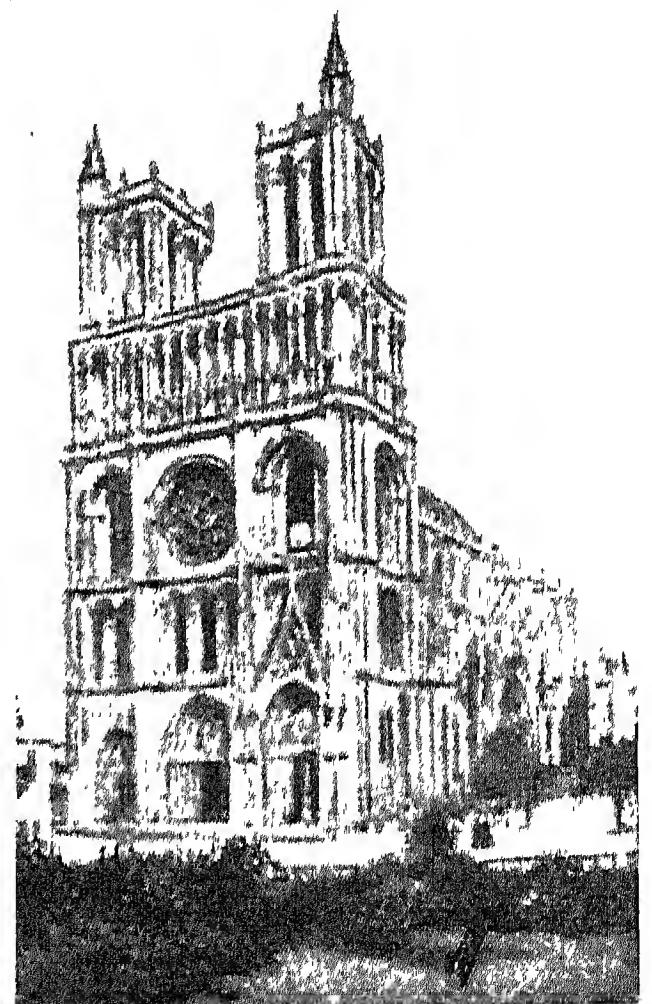
Mantelpiece. Upper part or cloak of a fireplace. In Romanesque architecture they were comparatively small and of the hood type. In Gothic decoration the hood was still the predominating form; but it was often of huge dimensions. With the Renaissance the canopy was replaced by rectangular structures, adorned

with columns, pilasters, cornices, and pediments. Heavy carving was introduced, decorated with figures, animals, flowers, and heraldic symbols. In Tudor and Jacobean England there was a mixture of Gothic and Classic, quaint but not unpicturesque. Inigo Jones and Christopher Wren introduced more purely architectural forms. Stone, marble, wood, faience, and metal have been used for mantelpieces, the marble and wood often being richly inlaid. Mantelpieces went out of fashion about the middle of the 18th century, and came into vogue again towards the end of the 19th; but the 20th century reversion to simplicity and the increasing use of gas and electric radiators did not encourage further development. See Chimney-Piece; House.

Mantes-La-Jolie. Town of France, in the dept. of Seine-et-Oise. Formerly called Mantes, and incorporating Gassicourt, it lies on the left bank of the Seine, 35 m. by rly. W. of Paris: it is the junction of the Paris-Dieppe and Paris - Cherbourg rly. lines. There is trade in cereals, fruits, etc., and tanning is carried on. Noteworthy buildings included a Gothic church of Notre Dame, chiefly from the late 12th century, with later additions, a 15th century hôtel de ville with a fine staircase, and the tower of S. Maclou church, destroyed in the Revolution.



Mantes arms



Mantes-La-Jolie, France. W. front of the Gothic church of Notre Dame

William the Conqueror was fatally injured by a fall from his horse at Mantes in 1087. Pop. 13,181.

During the liberation of France, 1944, U.S. armour reached Mantes-Gassicourt, Aug. 19; next day U.S. infantry established the first bridgehead across the Seine near by from which on the 22nd they began a strong offensive.

Manteuffel, EDWIN HANS KARL, FREIHERR VON (1809-85). German soldier. Born Feb. 24, 1809, he entered the Prussian army in 1827. In 1864 he served against the Danes, being made governor of Slesvig when the war ended. He led a division and then an army in the war of 1866. In 1870 he led a corps against France before becoming commander of the army in succession to Steinmetz. During 1871-73 he was at the head of the army of occupation. Made a field-marshal, he was governor of Berlin; and from 1879 of Alsace-Lorraine, until he died on June 17, 1885.

Mantilla (Sp., little mantle). Veil of black or white lace, the national head-dress of Spanish women, and also worn in Portugal. Originally it was a light cloak or cape, the material being usually a costly fabric.



Mantilla as worn by Spanish ladies

Mantineia. City of Arcadia in ancient Greece, which

gives its name to two famous battles. The first was fought in 418 B.C., and resulted in a victory for the Spartans over the combined forces of the Argives, Arcadians, and Athenians. The second was fought in 362 B.C. between the Spartans and the Thebans under Epaminondas, who was victorious, but fell in the battle. The site was excavated in 1888.

Mantis (Gr., diviner). Name given to insects of the family Mantidae (order Orthoptera), found in S. Europe and the tropics. Large and powerful, long in the body, and armed with forelegs specially adapted for seizing their prey, they vary greatly in form and colour, many of them being curiously like the leaves and flowers among which they lurk. The name praying mantis has been given to the common European species on account of its habit of resting with

its forelegs raised in a devotional attitude. The insects have always been held in superstitious awe by the Greeks, Turks, Hindus, etc.

Mantle (Lat. *mantellum*, napkin; cloak). Sleeveless, loose cloak worn over other clothes by either sex. The toga worn by the Romans and the peplos and chlamys of the Greeks were varieties of the mantle. In the present day a mantle forms part of the robes of state of peers and knights of various orders. See Costume; Toga.



Mantle of mid-Victorian fashion

Mantle. Appliance for lighting. The incandescent gas mantle is based upon the conversion of energy in the form of heat to energy in the form of light. Substances which radiate a high proportion of imparted heat energy in the form of light are therefore needed. The rare earths, thoria and ceria (which are the oxides of thorium and cerium respectively), are the principal sources. Invented by Karl Auer von Welsbach in 1884, the gas mantle was first produced commercially in 1886. Gradual improvement led to the inverted gas mantle, dome shaped for use with low pressure, and elongated thimble shaped for use with high pressure, gas supplies the differing shape of the mantle conforms roughly to the differing natural contour of the flames produced, and the size required depends upon the size of the burner.

A mantle is made by knitting an appropriately shaped bag from artificial silk. The open end is bound by asbestos thread to a fire-clay holder ring, and the fabric is impregnated with a solution of the nitrates of thorium and cerium, mixed in the proportion of 99 to 1

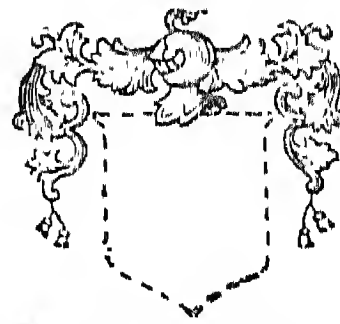


Mantis. Specimens of the curious insect called the praying mantis

(found by experience to be the best proportions), and dried. When dry, the mantle is burnt to convert the nitrates to oxides, and then dipped in collodion solution, which gives it sufficient strength for handling and transport. The collodion burns out when the mantle is first used.

Mantlet. Military term applied to grooves cut above and below the gunport in tanks to allow the gun to be elevated or depressed.

Mantling. Term used in heraldry. It includes the robe of estate placed behind a shield of arms, the silken capes and scarves or fancy scrolls pendent from the helm or crest, and by extension the ribbons and knotted cords placed as external decorations. Napoleon I and III had their heraldic robes powdered with golden bees, in this following the custom of the Middle Ages, when



Mantling in heraldry

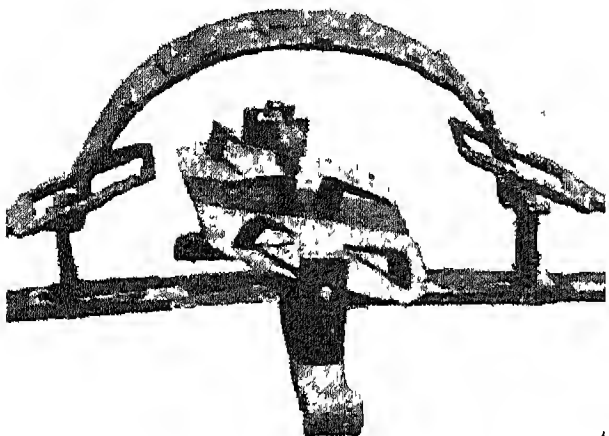
great nobles powdered both the cloak and lining with their badges.

The silken helm or crest scarf represents the scarf of authority worn in battle, or the gage of honour borne in tournaments, and is represented as tattered in strife. The foliated scroll is a degenerate form of the scarf. It is generally represented as scarlet, lined with white, or is a combination of the livery colours. In Scottish heraldry the scarf is sometimes replaced by a bunch of floating ribbons of the clan tartan. Such ribbons, but of livery colours, were used in the Middle Ages and represented as black, or alternately black and white, when the bearer was in mourning, or had taken vows to enter the religious life.

Mantoux, PAUL JOSEPH (b. 1877). French politician and educationist. Born at Paris, April 14, 1877, he became sec. of the Hautes Études Sociales in 1900, and was appointed professor at Chaptal college 1906, and at the Paris school of economics, 1910. A brilliant linguist, he came to London university in 1913, teaching literature and sociology, and leaving to serve in the First Great War. He was appointed director of the League of Nations political section in 1919 and left that office, 1927, in order to direct the Geneva high school of international studies, founded by him. He again became professor in Paris in 1935, staying until the outbreak of war in 1939

when he became head of the British section of the French ministry of information. He published books on the industrial revolution in the 18th century and on Britain.

Mantrap. Device for catching trespassers. A common form had a pair of metal gripping-jaws



secured horizontally, when set, by a catch, which was released when a member connected to it was stepped upon. Their use is now illegal except in houses between sunset and sunrise.

Mantras. Miscellany of psalms, hymns, and prayers forming part of the inspired Scriptures of the Hindus. The term is applied also to a text or religious formula used by Brahmans as a charm. See *Vedas*.

Mantua (Ital. Mantova). Province of N. Italy, in Lombardy. It is bounded E. by Venetia and S. by Emilia. Watered by the Mincio, the Po, and the Oglio, it is low-lying and fertile, producing rice, corn, and the vine. Area, 903 sq. m. Pop. (1951) 418,204.

Mantua (Ital. Mantova). City of Italy, capital of the prov. of Mantua. It stands on the river Mincio, 100 m. by rly. E.S.E. of Milan. Surrounded by lagoons and swamps and defended by walls, Mantua, the S.W. of the Quadrilateral fortresses, the others being Legnago, Peschiera, and Verona, was long considered the strongest fortress in Europe.

The cathedral, founded in the 12th century, has been altered from time to time, the interior having been remodelled by Giulio Romano. It is dedicated to SS. Peter and Paul. The city's finest church is that of S. Andrea. Planned by L. B. Alberti, it was begun in 1472. It has a façade of white marble, and some fine frescoes are among its interior decorations. In it Mantegna is buried.

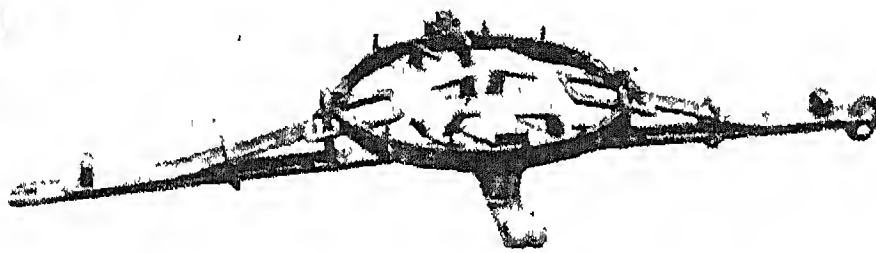
S. Sebastian's is another noted church. The ducal palace, begun in 1302, has 500 rooms, and mural decorations by Giulio Romano, a native of the city, who also designed the Palazzo del Te and decorated it with statues and frescoes. The castle of the Gonzagas, of the 14th century, with frescoes by Mantegna, houses the archives. There are museums, an observatory and botanical gardens, and also a fine academy of arts and sciences. The industries include ironworks, breweries, tanneries, oil-mills, doll factories, printing

of which it was the centre, was one of the most important of the smaller Italian states. In 1708 Mantua was taken by the emperor Joseph I, and it remained Austrian until 1797. In 1796, during his campaign in Italy, Napoleon laid siege to the city, and after a resistance lasting for eight months it was captured in Feb., 1797. Restored to Austria in 1815, it remained Austrian until 1866, when it was made part of the new kingdom of Italy. Pop. (1951) 54,848.

The city, which lay in the part of Italy occupied by the Germans after the armistice between Italy and the Allies of Sept., 1943, was captured from them by the 5th army without serious fighting, April 25, 1945, and suffered only scattered damage. The Casa della Cervetta had been destroyed in an air raid, Aug., 1944. The cathedral and S. Andrea escaped intact; the 13th cent. church of S. Francis was almost completely, that of S. Maurice completely, destroyed.

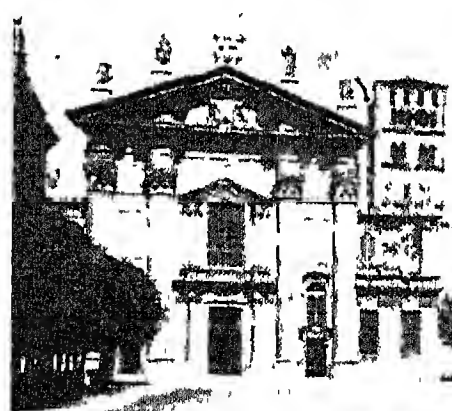
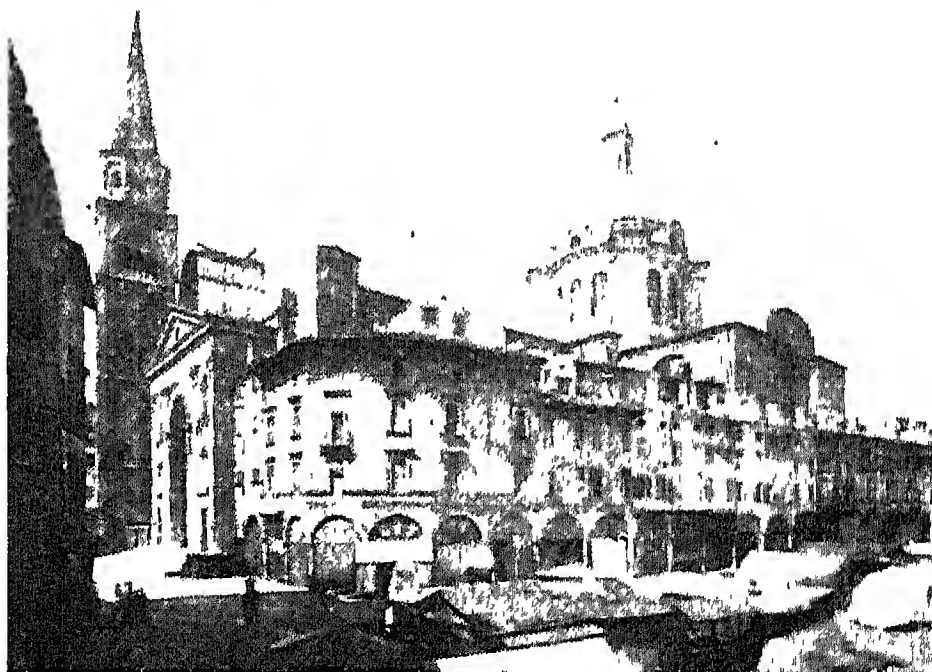
Mantzius, KARL (1860-1921). Danish actor and author. Son of a famous actor, Kristian Mantzius, his early studies were in philology. He was for 30 years associated with the royal theatre, of which he was director 1909-13, and distinguished himself in some of the plays of Björnson, Ibsen, Holberg, Molière, and Shakespeare. He wrote *A History of Theatrical Art*, trans. into English by L. von Cosel, 1903-09. He died at Copenhagen, May 17, 1921.

Manu (Skt., man). In Hindu mythology, the first man and the father of mankind. In the Indian story of the flood his life is said to have been miraculously saved by

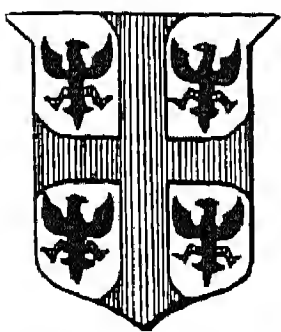


Mantrap. Specimen in the London Museum. Bottom, the trap shown open; top, left, closed

and paper-making establishments. A Roman city, Mantua was the birthplace of Virgil. It was taken by the Lombards, afterwards passing from one ruler to another in fairly rapid succession. Soon after 1300 began its long association with the family of Gonzaga. Members of this house, one of whom was made duke of Mantua, remained its rulers until 1708. Owing to the development of trade it became wealthy, while the duchy,



Mantua, Italy. Piazza Sordello, with the cathedral, left, and the façade of the ducal palace; monument in the piazza to the political martyrs of the rising in 1851. Top, vegetable market, with tower and dome of S. Andrea



Mantua arms

a fish, supposed to be an incarnation of Brahma, which dragged him, in a ship built by him, on to the Himalayas. Here he formed a woman of various substances, and by her became the progenitor of the human race. According to tradition, this being was the originator of the Laws of Manu. The object of these was apparently to support Brahmanism against Buddhism, and the laws, though regarded as uninspired, are still considered binding upon Brahmans. The work is probably a new edition, largely interpolated, of an older work, and dates from about the Christian era. There is an Eng. trans. by G. Bühler in *Sacred Books of the East*, vol. 25, 1885. See Brahmanism.

Manual Training. Term formerly applied to training in various handicrafts without any definite vocational aim. The idea was to train hand and eye as part of the general education of the faculties. Manual instruction was defined in the Technical Instruction Act, 1889, as "instruction in the use of tools, processes of agriculture, and modelling in clay, wood, or other material." Since then educationists have realized that much more is desirable, and much more than hand and eye can be developed through the teaching and practice of handicrafts. In consequence the term manual training has been generally discarded in favour of practical instruction (included in the Education Act, 1918) or crafts.

This practical aspect of education has been fully recognized in the provision of it for children of all ages, for adolescents, and for adults as a means of correlating and integrating the work done in separate subjects, *e.g.* mathematics, history, geography, science, and art. It has been advocated for the development of self-control, self-respect, and self-help, for stimulating the flagging interest of pupils, and for fostering interest in hobbies, a point of special importance to the millions of workers in repetitive processes.

Practical instruction varies in different schools according to the locality, the qualifications of the staff, and their idiosyncrasies. In some secondary schools boys will still have only instruction in woodwork and perhaps metalwork; in others they will design individually everything they make, and prepare, *e.g.* the scenery for school plays, or devise realistic scenes to illustrate geography, history, or scientific projects. Girls in one

school may have only rudimentary needlework and cookery; in another, the teaching of art will be applied to crafts or house furnishing; in another they will pursue a comprehensive housewifery course. Recent experiments suggest that the extreme differentiation of the craft courses of boys and girls may not be desirable, particularly in regard to crafts associated with the home.

Manul. Species of wild cat (*Felis manul*). It has a very broad, flattened head, and long fur varying in colour from grey to buff, with a few dark stripes. It is found among the hills in the wilder districts of Tibet and Mongolia, and feeds on small rodents.

Manumission (Lat. *manus*, hand; *mittere*, send). The freeing of a slave. In Roman law a slave might be freed either formally or informally. The formal methods were (1) *vindicta* or a fictitious law suit; (2) *censu*—by enrolment on the census; (3) *testamento*—by will. The informal methods included declaring him free before witnesses or conferring freedom on him by letter.

Manure. Material added to soil to increase its fertility. It is used to promote the growth of crops by supplying plant food, and by generally improving the soil as a medium for plant growth. The oldest kind is farmyard manure. Varro in 40 B.C., and Columella in A.D. 40, both describe in detail how it should be prepared and applied, and their instructions were generally accepted until the beginning of the 19th century. Farmyard manure acts in both the ways indicated above, and if it could be obtained in indefinite quantities farmers would ask for little else, but the amount is strictly limited. For many years, therefore, chemists have been confronted with the necessity of finding substitutes.

NITROGEN COMPOUNDS. These are perhaps the most effective of all added nutrients under ordinary British soil conditions, and of all possible nitrogen compounds nitrates are the best. For technical reasons only four nitrates are possible in practice, *viz.* those of sodium, calcium, potassium, and ammonium—and of these, sodium nitrate has proved the most convenient. It comes from Chile, where it forms great surface deposits; its origin is not known with certainty, but it was probably deposited from inland seas which have dried up; owing to its ready solubility in water it survives only in rainless regions.

Enormous amounts are used in agriculture and also for the manufacture of explosives, but supplies are said to be sufficient for over 300 years even at the present rate of consumption. Calcium nitrate, made artificially in large quantities in Norway, is an equally good fertiliser.

Ammonium sulphate is nearly as effective as sodium nitrate. It is produced from coal during the making of gas or coke, and before the First Great War was exported in large quantities from Great Britain. The ammonia can be taken up by plants, but normally it is first oxidised to a nitrate in the soil by micro-organisms. This process goes on without appreciable loss of nitrogen, but ammonium salts are not as speedy in their action as nitrates. Calcium cyanamide or nitrolim is artificially produced on a large scale in Sweden, Italy, Canada, and elsewhere, and easily gives rise to ammonia in the soil.

Many organic substances contain nitrogen in complex combinations which, however, speedily decompose in the soil, yielding ammonia, which then oxidises to nitrates. Usually a certain loss of nitrogen occurs during the process, so that these substances are not as effective as nitrate of soda or sulphate of ammonia. As they offer other advantages to the cultivator, they may command a higher market price per unit of nitrogen. The substances include bone, meat meal, dried blood, and other products from slaughter-houses, fish meals, and also residues from certain crushed oil seeds, shoddy, wool wastes, etc.

Nitrogenous fertilisers are of value on almost all soils and for almost all crops; they increase the weight of leaves, stems, and grain. The increased yield for the first increment of fertilisers is generally proportional to the quantity applied, but later increments produce smaller increases in accordance with the law of diminishing returns, and they may cause undesirable secondary effects, such as increased susceptibility to disease. Calcium cyanamide, calcium nitrate, and ammonia are produced in enormous quantities from the air, and there is no likelihood of any shortage of nitrogenous fertilisers ever arising.

PHOSPHATIC FERTILISERS. From time immemorial farmers have recognized the utility of bones as manure. When chemistry was applied to agriculture, it was realized that one effective constituent was

the phosphate, and that better results might be obtained by rendering this soluble by treatment with sulphuric acid. There is no longer a sufficiency of bone, but enormous deposits of calcium phosphate have been discovered. This rock phosphate is acted upon by sulphuric acid, giving a mixture of calcium mono-phosphate and calcium sulphate, which, however, is not separated into its components, but sold as superphosphate. This process was first worked out by Lawes, and it proved the foundation of a great artificial fertiliser industry, which for many years remained largely in British hands. Superphosphate is especially effective in promoting root formation, and it is largely used on the so-called root crops—swedes, turnips, etc.—and on potatoes. It also promotes early ripening of grain, and therefore is used for barley, which must be cut dead ripe, and for wheat and oats in the northern counties of England, and in Scotland, where harvest is apt to be delayed by bad weather.

Another important source of phosphate is basic slag. The richest and best is obtained from the Bessemer converter, but this is now largely displaced by the open hearth system, which gives a much poorer slag. Basic slag is alkaline and is especially well suited for the great grass areas of boulder and lias clay in the midland and northern counties of England.

The following table shows the increased yields that may reasonably be expected from the application of one cwt. of sulphate of ammonia or nitrate of soda, or one cwt. of superphosphate:

	1 cwt. sulphate of ammonia or 1½ cwt. nitrolim	1 cwt. superphosphate or high grade basic slag
Wheat, grain	4½ bush.	0-1½ bush.
" straw	5 cwt.	½-5 cwt.
Barley, grain	6½ bush.	2-3 bush.
" straw	6½ cwt.	0-2 cwt.
Oats, grain	7 bush.	1-3½ bush.
" straw	6 cwt.	0-2 cwt.
Hay	8-10 "	
Mangolds	32 "	20 "
Potatoes	20 "	10 "

Thus one cwt. of superphosphate which contains 11.8 p.c. of phosphoric oxide, P_2O_5 , is about half as effective as one cwt. of sulphate of ammonia, which contains 20 p.c. of nitrogen. In practice it is customary to apply at the rate of ¾ to 1½ cwt. of nitrate of soda or sulphate of ammonia per acre, and two to five cwt. of superphosphate or basic slag.

POTASSIC FERTILISERS. In the last decade of the 19th century large quantities of potassium salts were exported from Stassfurt in Germany, and proved very success-

ful on light, sandy, or peaty soils, and for crops such as mangolds, potatoes, and sugar beet, which make large quantities of sugar or starch. They are largely used in the potato-growing districts of Lincolnshire, Scotland, and Cheshire, by the mangold growers of Surrey and Norfolk, and also by the flax growers of N. Ireland. Certain waste products, such as flue dust from blast furnaces, or the rotary kilns of cement works, contain a fair amount of potash and are being exploited. Seaweed is also a possible source, as, too, is felspar. To some extent salt can economise potash in the plant. Potassic fertilisers give tone and vigour to the plant, and help it to resist diseases or other adverse circumstances.

Lime acts by improving the soil. It neutralises the acidity which often tends to accumulate; it flocculates the clay and maintains a good physical texture, and it tends to put out of action disease organisms such as finger and toe in turnips. It can be applied as quicklime at the rate of 10 cwt. to two tons per acre, or as ground limestone in double these quantities, or as chalk in still larger amounts. The use of chalk was known to the Britons, and the method of application as described by Pliny closely resembles that still used in Hertfordshire and the neighbourhood.

Farmyard manure contains all the elements of plant nutrition, and in addition its organic matter exercises important physical effects on the soil, improving the tilth and increasing the water-holding capacity. These physical effects

are largely due to the straw and the undigested food residues. Farmyard manure is applied at the rate of about 10 to 20 tons per acre. Very much of the fertilising value of farmyard manure arises from the

fact that the animal takes from its food mainly the carbon which the plant does not need, while it does not retain much of the nitrogen, phosphorus, and potassium which the plant needs. The richer the diet in these constituents, therefore, the better the manure. As a rule, one ton of farmyard manure contains 9-14 lb. of nitrogen, 4-5 lb. of phosphoric oxide (P_2O_5), and 9-15 lb. of potash (K_2O). The method of storage on the farm, however, is often extremely wasteful. From time to time other substances are put forward as posses-

sing manurial value, but none has stood the test of field trials. Liquid manure may be classed with farmyard manure. Occasionally it is used in the liquid form on permanent grass and seeds.

E. J. Russell

The cotton plant, as it has been proved, is one that well repays the use of manures. The actual cotton that is grown on the plant takes from the soil comparatively little of its fertilising ingredients, but it is quite otherwise with the seed, from which a valuable oil is obtained. The loss to the soil caused by removing the seed is best made good by the application of cotton oil cake, which is much the cheapest fertiliser that can be obtained in the United States.

The cake is used as manure, either directly or indirectly by giving it as food to the animals that are kept on the cotton fields. Of the other manures that are used in the cultivation of cotton, the most important are the offal of fisheries and abattoirs, and superphosphates made from the phosphates of South Carolina, Tennessee, and Florida. See Agriculture; Crops; Fertiliser; consult also A Student's Book on Soils and Manures, E. J. Russell, 2nd ed. 1919.

Manuscript (Lat. *manu scriptus*, written by hand). In the wider sense, anything written as opposed to anything graven or printed; in the narrower sense, a text written, before the general adoption of printing, on papyrus, parchment, or paper. It is very commonly abbreviated to MS., plural MSS. The name *chartae* is especially reserved for shorter public or private documents, chiefly of an official or business character, dating from the Middle Ages. The name *codex* (trunk of a tree), now applied to all old MSS. generally, was originally given to wooden tablets with a coating of wax, fastened together for writing upon. The sciences dealing with the documents and manuscripts in general are called Diplomatic and Palaeography.

The form of the manuscript depended upon the nature of the writing material. The papyrus roll-form (*volumen*) was the oldest, only one side as a rule being written upon; if both sides were used, the rolls were called *opisthographi* (written on the back). The modern book-form (*codex*) first came into general use in the 4th century of our era, when parchment had almost entirely ousted papyrus. In Rome, MSS. were as a rule taken down by several slaves at the same time from one person's dictation; this naturally led to a number of

mistakes, and these were further increased by the careless copying of the monks.

In the course of excavations at Herculaneum, 1752, and in Egypt from the beginning of the 19th century, a large number of papyrus-rolls has been discovered. The Egyptian finds, mostly in Greek, throw considerable light upon the condition of the country in the time of the Ptolemies and under the empire. Greek literature has acquired valuable additions, as the mimes (farces) of Herodas, odes of Bacchylides, fragments of Menander, and Aristotle's Constitution of Athens. The most important parchment MSS. are the palimpsests (rubbed again), the writing upon which has been erased or rubbed out, so that the parchment could be used again. The original writing has in some cases been restored by the use of chemicals, and deciphered. One of the oldest of the parchment MSS. is the Codex Sinaiticus of the Bible, belonging to the 4th century, and discovered in a Sinai convent. Another famous MS. is the *codex argenteus* of the Gothic translation of the Bible by bishop Ulfilas.

In MSS. the gathering of the sheets in quires was of great importance. Each quire contained a number of sheets, generally four, folded down the middle and placed inside each other, thus making 16 pages. The middle was indicated by a string. Since pagination was not adopted till the 15th century, the test of the completeness of a MS. was the number of pages on each side of the string. The chief task in dealing with several MSS. of the same work is to investigate their mutual relations, especially in the matter of mistakes in which they agree, and to construct a genealogical table, to establish the text of the archetype, or original, from which they are derived. See Book; Diplomatic; Kells, Book of; Palaeography; Writing.

Manutius, ALDUS (1450-1515). Latinised name of the Italian scholar-printer, Aldo Manuzio or Manucci. He studied at Rome and Ferrara, and about 1490 founded a press at Venice. Here were printed the editions of the Greek, Latin, and Italian classics known as the Aldine editions (*q.v.*). He did much to spread the new learning, and was remarkable for



Aldus Manutius,
Italian printer

his scholarship and care in securing accurate texts, beautiful compact type, and the cooperation of a band of scholars. After an absence from Venice, 1506-12, he set up his press again with his father-in-law, Andrew Asola, as partner. He died at Venice, Feb. 3, 1515, and was succeeded by his son Paulus (1512-74) and the latter's son Aldus (1547-97).

Manx Language AND LITERATURE. Manx is the form assumed in the Isle of Man by the Gaelic branch of the Celtic languages. In general structure it is rather more similar to Scottish than to Irish Gaelic. Its orthography is based on English spelling and pronunciation. The earliest record of the language is in Bishop Phillips's translation of the Book of Common Prayer made in 1610. Manx was the everyday speech of the majority of the population up to the first half of the 19th century, but few native speakers remained in the mid-20th. Original literature is sparse. There is an Ossianic poem in an 18th-century MS.; a number of ballads and carols traditionally sung on Christmas Eve; and an 18th-century translation of the Bible, begun by Thomas Wilson and completed by Mark Hildesley, both bishops of Sodor and Man.

Manzanares. River and town of Spain. The river, on which stands Madrid, flows S. for a course of 40 m. to join the Henares. The town is a rly. junction on the



Maori. Left, Maori woman carrying her child on her back. Right, an old chief

Azuer in the prov. of Ciudad Real, 27 m. E. of the city of that name. It is in the arid, elevated area of La Mancha. There is an old castle. It carries an important trade in wheat and wine. Pop. (1950) 18,204.

Manzanillo. City and harbour on S.E. coast of Cuba, in the prov. of Oriente. Situated at the mouth of the river Canto, it has a commodious harbour, from which sugar, lumber, tobacco, and hides are shipped. It is a rly. terminus, and has connexion with the main

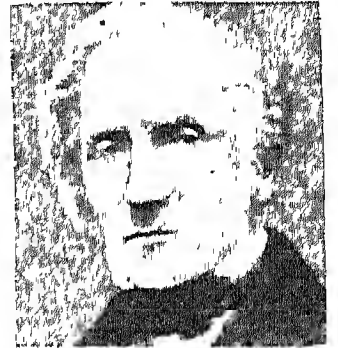
line from Santiago to Havana (487 m.). Pop. 65,965.

Manzanillo. Seaport of Mexico, in the state of Colima. It stands on Manzanillo Bay, an opening of the Pacific, 38 m. by rly. W. by S. of Colima. The harbour has been rendered secure by a breakwater and sea wall, and the port is visited by steamer services. Population, estimated, 30,000.

Manzoni, ALESSANDRO (1785-1873). Italian writer. Born at Milan, March 7, 1785, he became the leader of the romantic and medieval reaction in Italian literature. His tragedies, *The Count of Carmagnola*, 1820, and *Adelchi*, 1822, mark an epoch in Italian drama by their adoption of Shakespearean methods, and by bold romanticism; his novel of 17th cent. Milan life under Spanish rule, *I Promessi Sposi* (*The Betrothed*), 1825-27 (new Eng. trans. by Archibald Colquhoun, 1951), established a world-wide reputation and created a school of historical novelists. Later Manzoni wrote *Letters on Romanticism*. He died at Milan, May 23, 1873.

Maori (Maori, man). People of Polynesian stock in New Zealand. Numbering 113,777 in 1951, mostly in North island, they are tall, muscular, olive-brown, with straight or wavy hair, and oval faces of Caucasoid mien. They preserve traditions of the arrival from Rarotonga c. A.D. 1350 of their tribal ancestors in a fleet of six double canoes or single outriggers. The newcomers found an indigenous population, partly Papuan, being absorbed into earlier Polynesian immigrations, especially one from Tahiti, c. 850.

Without metals, pottery, or weaving, they practised cookery in hot-stone ovens, having brought with them the sweet potato (*kumara*) and the yam (*taro*), also, it is said, the native dog. The colder climate led to the construction of substantial rectangular timber houses, wrought with jade adzes and chisels, and the development of a virile art, especially in the carving of bargeboards, gables,



Alessandro Manzoni,
Italian novelist

houseposts, and canoes. Personal ornament included jade amulets, *heitiki*, in the form of human embryos. Face-tattooing, of the type called *moko*, was effected by grooving elaborate designs into the flesh with sharp-edged bone adzes. This custom, reserved for the ruling class, has ceased, but women still tattoo on lips and chin. New Zealand flax was plaited by hand into shoulder-mats and waist-mats, sometimes enriched with kiwi or moa feathers. Cannibalism and infanticide formerly prevailed.

The priests, *tohunga*, controlled taboo and divination, and preserved the national chants, *karakia*. When they exercised temporal power they were called *ariki*, divine chiefs, superior to the secular headmen of the clans. Their insignia were a huia feather in the head-dress and a staff, *taiaha*. Their pantomimic dances comprised the warriors' *haka*, with weapons and violent movements, and the *poi*, in which women twirl between the fingers balls of dried bulrush leaves.

The communal life was much modified by contact with settlers; now nominally Christian, they are eager for education. Four Maoris are elected to the house of representatives, and there is a minister for Maori affairs. The Maoris mix with the white population on completely equal terms, intermarry without adverse comment, and take their place side by side in industry, commerce, and government. The fact that the Maori population rose from 48,000 in 1901 to 132,000 in 1955 is an indication of healthy progress.

Maoris fought with distinction in the Second Great War. The famous New Zealand div. of the British 8th army included a Maori battalion, and in all over 6,000 Maoris served overseas. Recruiting among them was voluntary; none the less nearly 40 per cent of Maoris of military age joined the forces. A Maori officer, 2nd Lieut. Moana-Nui-a-Kiwa Ngarimu, was awarded a posthumous V.C. for gallantry near El Hamma, Tunisia, March 26, 1943. Consult *The Old New Zealand*, F. E. Maning, 1863; *Maori and Polynesian*, J. M. Brown, 1907; *Hawaiki*, S. P. Smith, 3rd ed. 1910; *The Maoris of New Zealand*, J. Cowan, 1910; *The Maori, Yesterday and Today*, J. Cowan, 1930; *The Coming of the Maori*, P. H. Buck, 1949.

Maori Wars. British campaigns against the Maoris. By the treaty of Waitangi, 1840, Great Britain assumed the sovereignty of

New Zealand, guaranteeing the Maoris possession of their lands and fisheries. But friction soon arose between the Maoris and the colonists over the ownership of the land, and resulted in the first Maori War, 1845-47. It consisted of skirmishes and ambushes, and was closed by the settlement of boundaries.

The second war, due to hostility between the two peoples, was waged in a desultory fashion during 1860-64; there were few definite engagements. Despite bad leadership and ignorance of European tactics, the Maoris proved themselves stubborn fighters. A third war of increased bitterness started in 1864 with severe engagements, in which both sides lost heavily; but the struggle dragged on. The massacre of the settlers at Poverty Bay and Mohaka, 1868, aroused further bitter fighting which did not end until 1872, when the Maoris submitted.

Mao Tse-tung (b. 1893). Chinese soldier and politician. Born at Shaoshan, Hunan, the son of a farmer, he was educated at Chang-sha normal school, fought in the revolution of 1911-12, and was an assistant in the national library at Peking 1918-20, where he became interested in the works of Karl Marx. He joined the Chinese Communist party in 1921, and during 1922-27, when the Communists allied themselves with Chiang Kai-shek's Kuomintang, devoted himself to spreading Communist doctrine amongst the peasants of Hunan and neighbouring provinces. In 1927 Chiang turned against the Communists, and most

of their surviving leaders went into hiding; but Mao armed his peasants and, though he suffered



Mao Tse-tung,
Chinese leader

reverses, managed to form a Communist administration in Kiangsi. In 1934, to escape the Kuomintang forces, he led his adherents on the famous "long march" of the "Eighth Route Army" —6,000 miles

to Yen-an, in Shensi prov., some 85 m. S.E. of the Great Wall. There he set up a Communist govt.

When the Japanese attacked China, 1937, he cooperated with Chiang's national govt. against the enemy; but friction soon developed, and Mao continued to extend the area of Communist domination within China. By Feb., 1948, Mao had virtual control of Manchuria, and nationalist forces were deserting to him in large numbers. Invading China proper, the Communists captured Peking, Jan. 22, 1949, and by the end of that year Chiang's authority had been eliminated throughout the Chinese mainland and replaced by that of Mao. On Oct. 1, 1949, the people's republic of China was inaugurated at Peking, with Mao as chairman of the central govt. and head of state; and on Feb. 14, 1950, he signed in Moscow a 30-year treaty of friendship and mutual assistance with the U.S.S.R.

MAPS AND MAP-MAKING

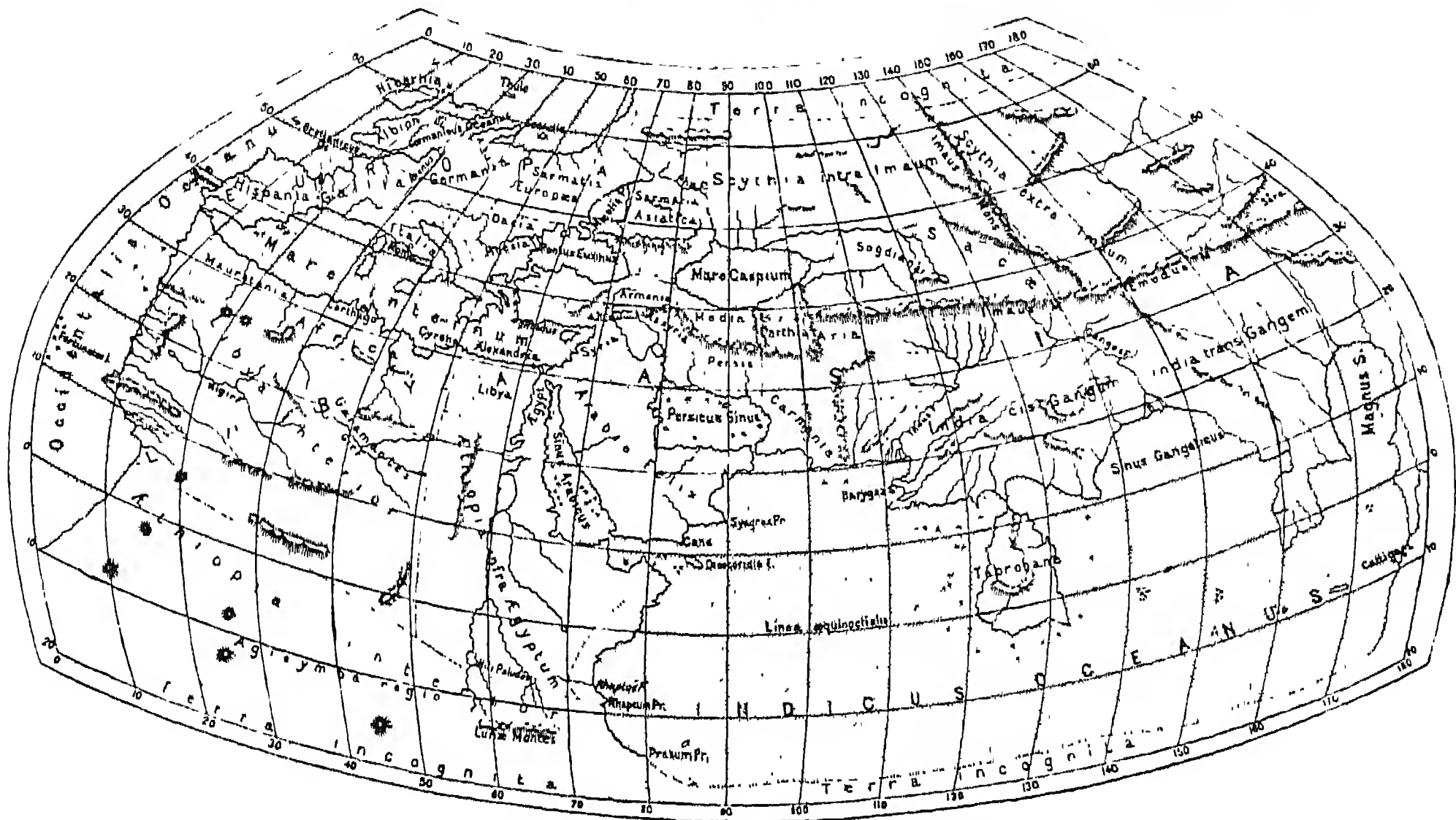
Brigadier M. O. Collins, C.B.E., F.R.I.C.S.

The history of map-making is here followed by an explanation of how contemporary maps are made and of the way in which they can be used. Related articles include those on Projection and Surveying. See also noted map-makers, e.g. Mercator; Ptolemy; Saxton

A map is a diagram showing either natural or statistical features in their correct geographical relationship. Topographical maps show all the permanent features on the surface of the earth which can be shown at a particular scale, and for that reason are generally classified according to their scale. The scale, or proportion between a given length on the map and the same length on the ground, is expressed either in units of length or as a representative fraction (R.F.) with a numerator of one: thus, a scale of one inch to one mile can also be expressed as 1/63360. Topographical maps are

subdivided into large scale maps, which include plans of scales of six inches to one mile (1/10560) and larger, and show virtually all natural and permanent features on the ground in their correct position; and small scale maps which cannot record everything but show the features any one scale can carry in symbolised form.

Statistical maps show information or statistics in relation to their geographical location and they are therefore generally superimposed or over-printed in one or more colours on to a topographical map of a suitable scale. Typical maps of this kind may show



Map of the world according to Ptolemy, about A.D. 160. Lines of latitude and longitude were added later

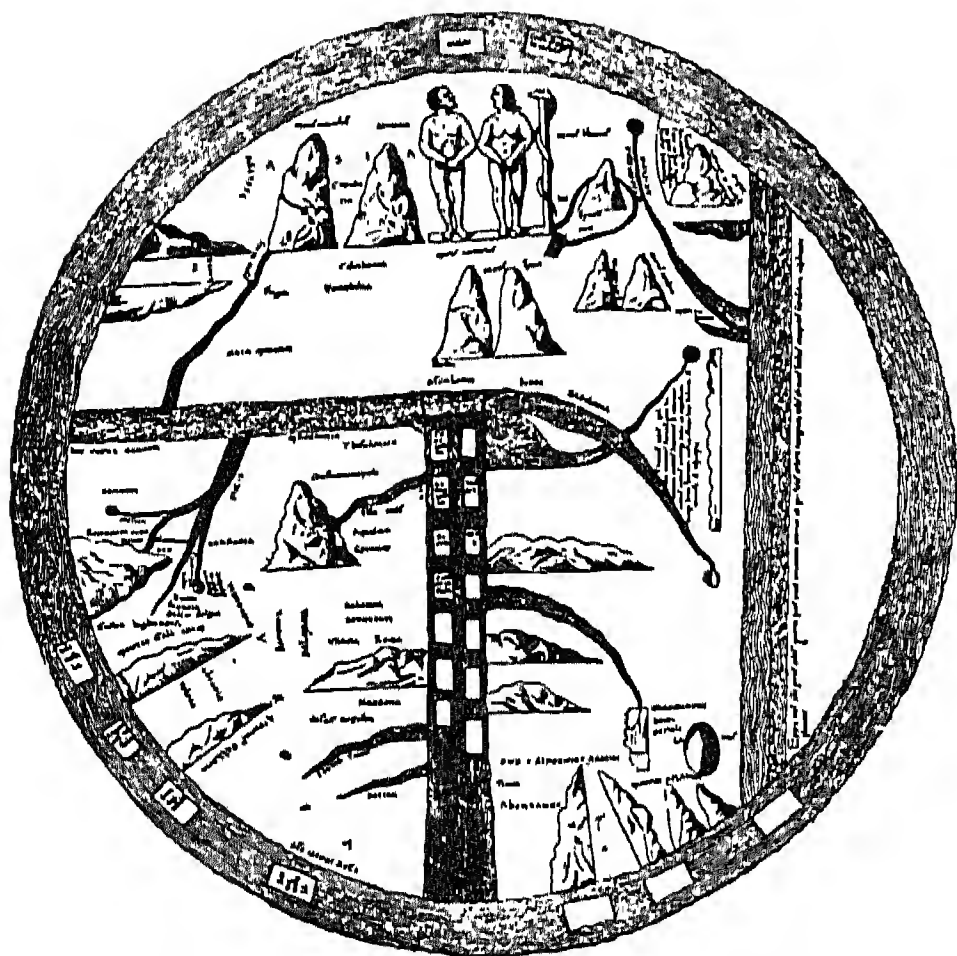
geological features (draft maps and solid maps), weather data (climatic maps), or densities and distribution of certain facts, *e.g.* population.

Map-making, or cartography, is the art of showing data in diagrammatic form in relation to its position on the earth's surface. The raw material comes from the traveller, the surveyor, or the statistician, and the final product may be a single drawing or printed copies in many colours. The art aims at achieving a balance between the amount and kind of data which can be shown and the clarity from the readers'

point of view of the map or plan. The cartographer employs both the draughtsman and the printer to help him achieve his end.

The history of cartography can be said to ante-date the art of writing as there are many records that primitive people could show by crude diagrams the way from one place to another. Such diagrams made with twigs and shells by the Marshall Islanders were used as late as the 19th century. The earliest known maps are on clay tablets found in the ruins of Babylonia. But all these records are fragmentary, and it was not until the 6th century B.C. that

cartography as such can claim to begin, though individual Egyptian and Chinese maps of an earlier date are known. In the 4th and 5th centuries B.C. it was still believed that the world was more or less oblong in shape and was twice as long from east to west as it was from north to south—the terms longitude (Lat. *longus*, long) and latitude (Lat. *latus*, broad) are derived from this conception; but by the 3rd century B.C. Greek geographers had appreciated that the world was spherical in shape, and Eratosthenes calculated its size to within 14 p.c. of the present accepted



12th-century map of the world (E. at top)



Hereford Map, compiled about 1280

figure. They also conceived the sub-division of the sphere by parallels and meridians. Greek cartography culminated in its association with Ptolemy of Alexandria (*fl.* A.D. 127-151), who produced the famous *Geographike Syntaxis* which not only gave a series of maps, but listed places by their latitude and longitude and discussed the principles of cartography and projections.

Roman civilization had no connexion with the Greek discoveries and little is recorded of Roman cartography other than itineraries and cartograms of the imperial highways, *e.g.* the Peutinger Table. But the Romans left a primitive pattern for the typical world map of the Middle Ages sometimes called the "wheel" map or T-O Map. In these maps east is at the top, with the Garden of Eden, Jerusalem is at the centre, and the habitable world is surrounded by Ocean.

The subsequent period up to the 15th century A.D. produced two separate types of map: monastic works, such as the Hereford map, which were developments of the wheel maps and chiefly remarkable for their size and the extent to which their authors imagined quaint figures and beasts to fill up blank spaces. They were the products of the secluded life.

At the same time as the ecclesiastics were depicting a mainly imaginary world Mediterranean seamen were producing charts of the coast of that sea based on surveys by the compass, which began to come into use in Europe during the 13th century. These "Portolan" charts made on single sheepskins showed coastal, but little inland, detail; they were remarkably faithful pictures of the Mediterranean seaboard.

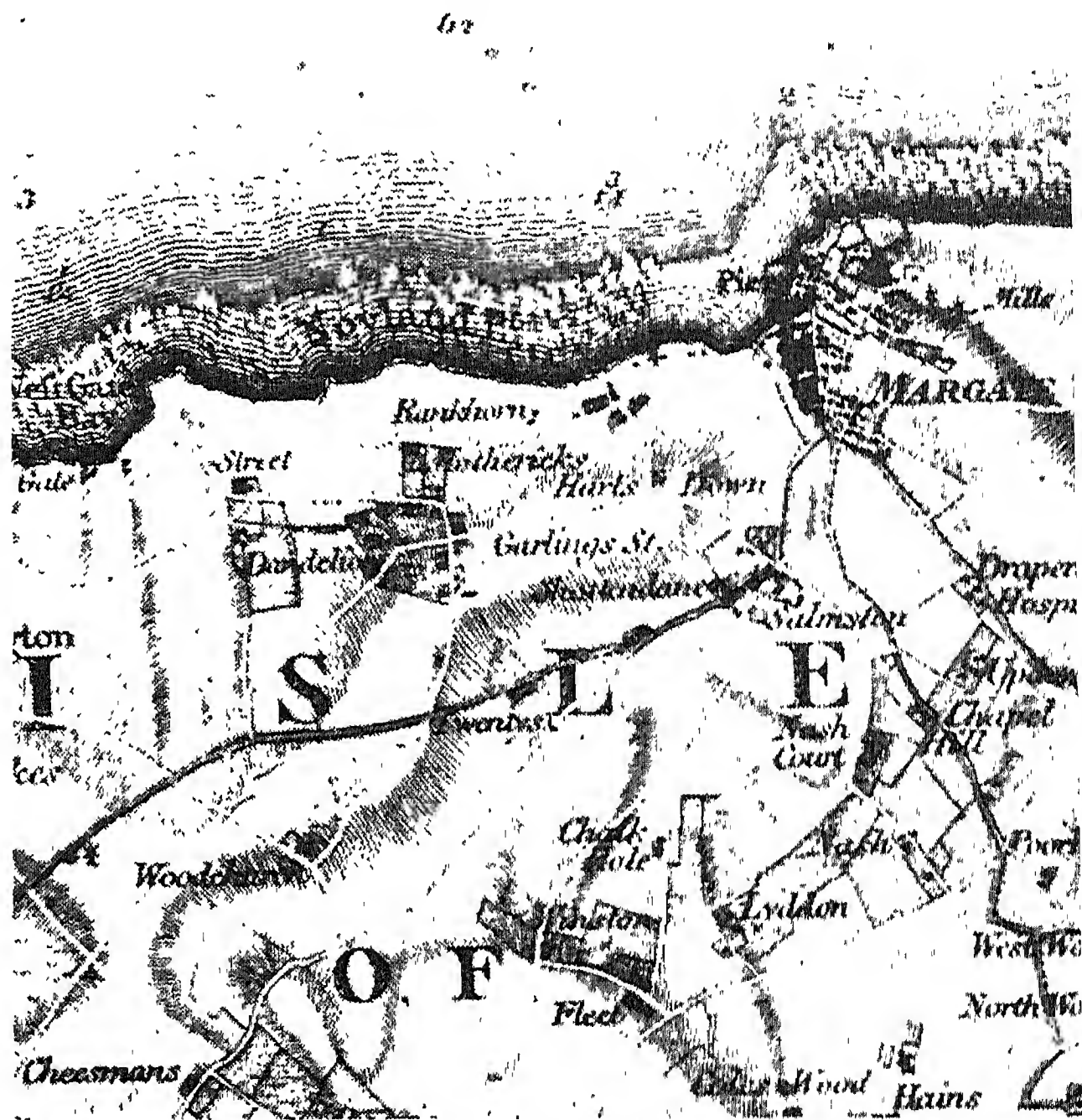
The 15th, 16th, and 17th centuries saw a renaissance of cartography as a result of the re-discovery of Ptolemy's *Geographike* and its translation into Latin. This stimulated the Italian cartographers in the first instance; but the discoveries made by the seafaring nations meant that their cartographers had much to record of the voyages of men like Magellan, Columbus, and Drake, and the invention of printing and engraving meant that they could produce their results more cheaply than could their predecessors. This encouraged the Flemish map-makers Gerardus Mercator and Abraham Ortelius, Christopher Saxton of England, Diego Ribero of Spain, and Martin Waldsee-

müller of Alsace (who, in his *Cosmographical Introductio*, 1507, first suggested the name America for the newly discovered lands to the West). Maps of many countries in central Europe and of America first appeared during this period, but these were essentially compilations from travellers' tales, occasionally supplemented by other data.

The 18th century saw the beginning of a more critical and scientific approach to surveying the earth, and the resultant maps soon reflected this outlook. The French led this reformation, J. B. B. d'Anville making a much more critical

scale of one inch to the mile to get it on the paper. If a larger area is required on the same piece of paper, say an area of 60 miles square, the map would have to be at the smaller scale of one-tenth of an inch to one mile. The normal method of expressing the scale of a map is by a representative fraction: thus, the scale of a map drawn one inch to one mile can also be expressed $1/63360$, there being 63360 inches in a mile.

Maps on scales of $1/1,000,000$, $1/100,000$, $1/50,000$, and similar round figures, *i.e.* based on a decimal system of measurement, are frequently made for inter-



Map. Small section from the one-inch map of Kent made under the direction of Capt. W. Mudge, R.A., F.R.S. (1762-1820), by draftsmen of H.M. Honourable Board of Ordnance

evaluation and use of available data even before much real surveying had been done by Cassini de Thury. It was also during the latter part of the 18th and the early part of the 19th century that large national surveying organizations, such as the Ordnance Survey of Great Britain and the Survey of India, started to produce the type of map produced today.

Scale. The area which can be covered by any map is governed by the size of the paper and the scale at which the map is produced. If it is necessary to produce an area six miles square on a piece of paper six inches square the map has to be plotted at a

national reasons, as it is then simple for persons accustomed either to English measurements or to the metric system to make a comparison between ground and map measurements. The scale of the map governs the amount of detail which can be, and is, shown. On large scales such as $1/2,500$ it is possible to show most ground features in their correct position. As the scale gets smaller, certain details such as roads have to be exaggerated in size to retain their importance until, in topographic maps of scales larger than $1/250,000$, the detail is shown in conventionalised or symbolised form. The scale selected for any

map is therefore a function of the size of paper on which it is printed and of the detail to be shown.

Projection. Since the earth is nearly spherical, any surface features on it can be shown in their correct position relative to each other only on a globe of similar shape. Such three dimensional objects are not either convenient to use or easy to produce in quantity. Methods have had to be devised therefore for representing the curved surface of the earth on a flat piece of paper. This is done by means of a projection, which is any regular means of showing meridians of longitude and parallels of latitude on any plane surface. The term is derived from the geometrical methods of projecting these lines on to a cone or cylinder from the surface of the sphere. In virtually no instance is the process as straightforward and as simple as that. Usually the network of latitude and longitude on a map is created by certain laws expressed for convenience as mathematical equations. It is not possible to "project" the surface of a sphere on to a plane and to retain the proportion of lines (or areas) and the quality of angles.

Types of Projection

There are three main types of projection. A map may be constructed so that small portions retain very nearly their proper shapes. These are conformal and orthomorphic projections. Their drawback is that the scale increases outwards from the centre. In the most commonly used atlases which show the world in this way, Greenland is shown equal in size to South America. In another type of projection all countries retain their correct areas but the shape of each is somewhat distorted. Such maps have obvious advantages for presenting statistical data; they are equal area projections. It is also very necessary to produce maps on which all points retain the proper compass bearing of the routes between them: these are azimuthal projections.

Once the most suitable scale and projection have been decided parallels and meridians can be plotted in their correct positions. It is then necessary to assemble the raw material from which the map will be made. This is compilation. Where the cartographic work is preceded by a specific survey on the ground, this process may be a simple one as the field

sheets of the surveyor will have been designed to produce all the necessary information in the easiest form. But such instances are relatively rare and are generally limited to large scale plans. Nearly always there will be many data in the form of other maps and partial surveys, on different projections, together with travellers' or surveyors' written reports. Many of these may show the same ground feature in a different way and on a different scale. These must be evaluated and accepted, or discarded, in part, or whole, to produce the compilation drawing, which is a comprehensive assembly of all the available material, however varied it may be, and is the rough drawing of the final map.

In the past, each map was an individual finished drawing. Nowadays it is more normal to print maps by offset lithography, in which each colour is printed separately. The final appearance of the map partly depends on the number of colours used. From the compilation, a separate fair drawing has to be made for each colour. In addition to colours, the appearance of the map is dependent on how individual ground features are shown, particularly when the map is conventionalised and features are shown by symbols.

Wherever symbols are used, a key is provided. This is often combined in the margin or in a "box" with other details such as scale, the direction of North, the local magnetic variation, and any titles or numbering to identify the particular map.

As a map has to show a three-dimensional picture, some means has to be devised for showing relief. There are several possible ways, but that most normally used is by means of lines of constant height, or contours. These are sometimes accentuated by layering when successive contour "steps" are shown by a graded colouring so that the higher the land becomes, the darker is the tone on the map. Consult General Cartography, Erwin Raisz, 1938; British Maps and Mapmakers by Edward Lynam, 1944.

Map OR MAPES, WALTER (c. 1140-c. 1210). A medieval Latin author of the Welsh Marches. Probably a native of Herefordshire, of Welsh origin, he studied in Paris and was present at the Lateran council in Rome, 1179. Successively chancellor of Lincoln and archdeacon of Oxford, he was also clerk of the court to Henry II, and

acted as justice itinerant. He wrote *De Nugis Curialium*—i.e. courtiers' gossip, a miscellany of historical and legendary anecdotes, containing some curious folklore, and also details of his own life. He was probably the author of a French poem on Lancelot du Lac, the original of the prose romance of that name, and some critics believe he had a great share in shaping the legends of the Holy Grail and the death of Arthur. Some MSS. also attribute to Map, though doubtfully, the authorship of a remarkable cycle of satirical Latin poems on the vices of the clergy, celebrating an imaginary Bishop Golias or Goliath.

Maple (*Acer*). Genus of trees of the family Aceraceae. Native to Europe, Asia, and N. America, they have opposite, undivided leaves and greenish or red flowers,

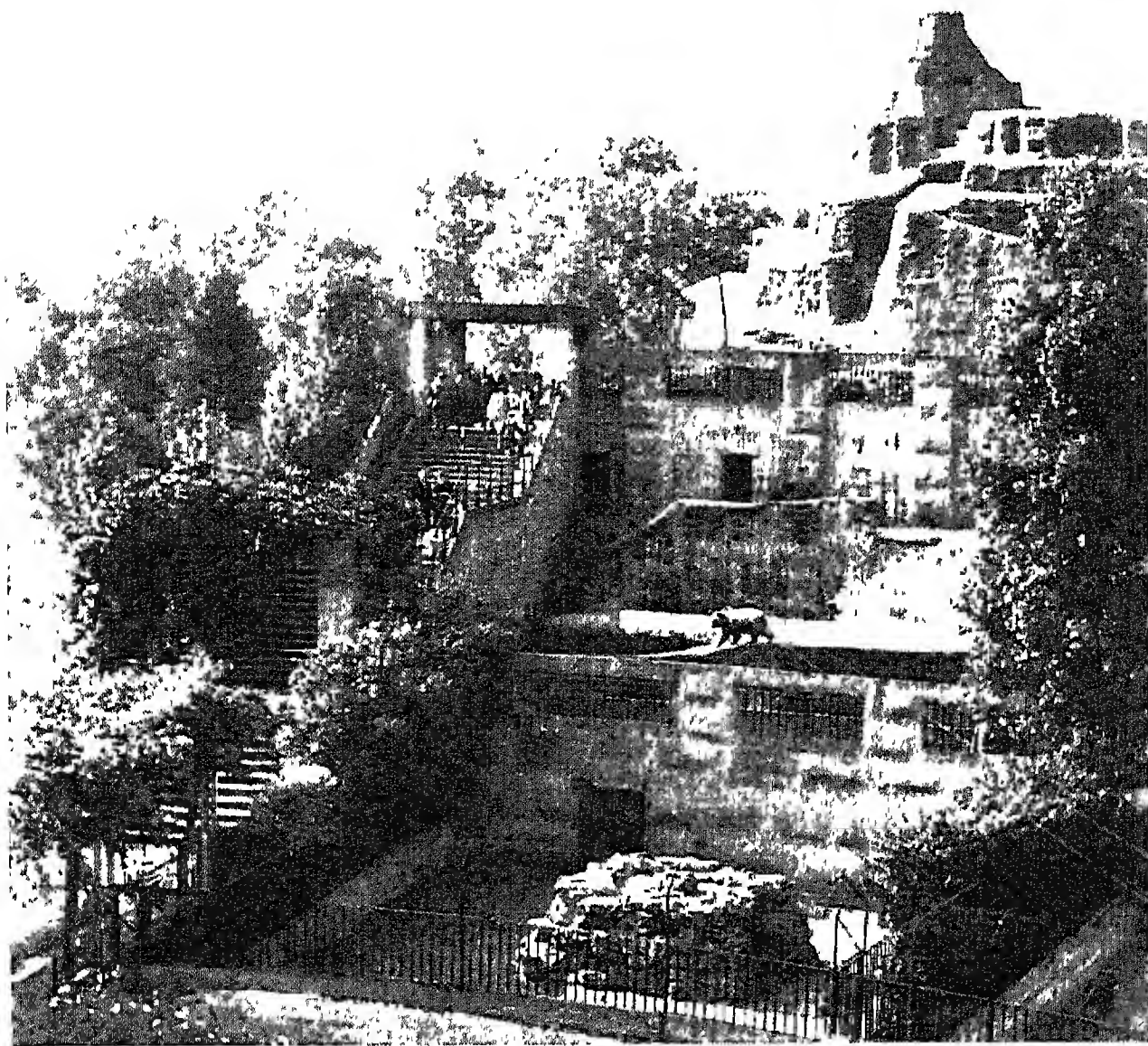


Maple. Common field maple in full leaf

succeeded by a pair of conspicuous "keys," each consisting of a seed and a wing. They produce useful timber, and the sap is rich in sugar. Several of the American species, in particular *A. saccharinum* and *A. rubrum*, are systematically tapped just before spring, when the sap is ascending, and yield great quantities of maple-sugar. The sycamore or great maple of Europe and W. Asia is *A. pseudoplatanus*; the common field maple of the same countries is *A. campestre*. Many species are grown in European gardens for the sake of the attractive rich autumnal tints of their foliage.

The maple leaf is the national emblem of Canada.

Mappin Terraces. Section of the London zoological gardens. First opened to the public in 1913, they were improved after the First Great War by the addition of hills of concrete. The terraces



Mappin Terraces. Feature of the London Zoological Gardens, where visitors can study the exhibits without the interception of bars. The gift of John Newton Mappin, the terraces were opened in 1913

occupy a quadrant-shaped area, in which the animals are seen in tiers. Species of antelope are at the top, bears occupy the middle enclosures, and waterfowl are at the bottom. There are no bars between the exhibits and the on-lookers, a deep ditch keeping dangerous beasts within bounds.

Maqui (*Aristotelia macqui*). Evergreen shrub of the family Elaeocarpaceae. It is a native of Chile. It has oblong, toothed leaves and small greenish flowers, followed by small acid berries, at first dark purple, then black, from which is made a wine used as a cure for malignant fever. The wood makes musical instruments, and the tough bark yields strings.

Maquis (Fr. from Ital. *macchia*, thicket). Name given to wild, scrub covered areas of Corsica which have frequently served as shelter for bandits. The young men who took to the woods and mountains in Haute-Savoie and elsewhere to avoid being conscripted by the enemy for labour or armed service after the Germans overran formerly unoccupied France in Nov., 1942, called themselves men of the maquis, and under that name formed themselves into resistance groups. Belgians similarly sheltering in the Ardennes (among whom was Prince Charles, Count of Flanders, who

became regent of Belgium in Sept., 1944) also adopted the name. See Resistance Movement.

Mar, EARL OF. Scottish title held by the family of Erskine. Mar was one of the ancient divisions of Scotland, comprising most of the S. half of what is now Aberdeenshire. From the



Maqui. Foliage and flowers of the Chilean shrub. Inset, left, flower; right, fruit

12th cent. it was ruled by an earl, who was later one of the seven earls of Scotland. Little is known of the early earls of Mar. In 1377 Thomas, 13th earl, died childless. His sister Margaret, who inherited, married William, earl of Douglas, and their daughter Isabel on her marriage with Alexander Stewart

brought him the title earl of Mar. She died childless in 1407, he in 1435; and the title was adjudged in 1457 to have reverted to the crown in the person of James II of Scotland. He granted it to his son John who died unmarried in 1479. It was afterwards given to other members of the royal family.

In 1565 the earldom was successfully claimed by John, 6th Lord Erskine (d. 1572), as a descendant of one of the early earls, and he is known as the 1st or 6th earl, this double numbering being retained for a time by the succeeding earls. The lands formerly attached to the title, which had been alienated, were recovered by John, the 2nd or 7th earl. John, the 6th or 11th earl, whom his enemies nicknamed Bobbing John, attainted for his share in the rising of 1715, was deprived of the earldom, the Old Pretender, however, making him duke of Mar.

The earldom was restored to his grandson John Francis Erskine in 1824 by Act of parliament. The new earl's grandson succeeded him and succeeded also to the earldom of Kellie (created 1619) by a decision of 1835. On his death, the earldom of Mar was the subject of protracted dispute; a cousin of the late earl inherited without question the earldom of Kellie, and claimed the earldom of Mar, to which there was a rival claimant through the female line in the person of a nephew of the late earl's named John Francis Erskine Goodeve. The title was granted in 1875 to the Lord Kellie, but with precedence only from 1565. This decision was confirmed by Lord Selborne and the lord chancellor in 1877; but was not accepted by Goodeve, who continued to call himself earl of Mar and in 1885 secured, after prolonged legal proceedings, the passage of an Act "restoring" to him the original earldom. He became the 33rd earl of Mar, with precedence from 1404, while his kinsman retained the title earl of Mar and Kellie. The earl of Mar is the premier earl of Scotland; his eldest son is known as Lord Garioch. The earl of Mar and Kellie is also Viscount Fentoun, premier viscount of Scotland, and hereditary keeper of Stirling Castle; his eldest son is Lord Erskine.

Mar, SERRO DO (Port., mt. chain of the sea). Range of coastal mts. of S.E. Brazil. It is in reality the scarp edge of the S. Brazilian plateau, whence many streams flow to the Parana or Uruguay down the long inland slope. Near

Rio de Janeiro its peaks attain an alt. of 6,000 ft. to 7,000 ft.

Marabou (*Leptoptilus crumeniferus*). Species of stork found in Central Africa. It is of large size and ugly appearance, with almost bare head and a pendulous pouch in front of the throat. The marabou is allied to the adjutant stork (*q.v.*).

Marabouts. Class of Mahomedan enthusiasts or devotees among the Berbers of N. Africa. They lead public worship in the mosques, profess to work miracles and prophesy, and are revered as saints. In the 11th and 12th centuries, during the Almoravid dynasty, named after them, they exercised great power in Spain and Morocco. Their temporal power has long since disappeared, but in the 19th century they were the chief opponents of French influence in Algeria. The word is also applied to a shrine at the tomb of a marabout. See Mahomedanism illus. page 5418.

Maracaibo. Lake in Venezuela. It covers over 5,000 sq. m. and is in reality an inland bay joined to the sea by four separate channels, the largest of which is 8 m. wide and 34 m. long. The lake is a quadrangle about 130 m. long and over 50 m. wide. It is navigable for shallow-draught vessels. Oil is obtained from its bed and basin.

Maracaibo. Seaport of Venezuela and capital of the state of Zulia. It stands on the W. shore of a strait leading from the gulf to the lake of Maracaibo, 400 m. W. of Caracas. Although its harbour is small and difficult of access between Oct. and April, it is the second seaport of the republic and a transit port for E. Colombia. It has been completely modernised, and miles of new streets have been built. The climate is damp and hot. It is the centre of the oil industry (production rose from 119,000 barrels in 1917 to 626,434,000 barrels in 1951), and its chief export is crude petroleum; other exports are sugar, rubber, dye-woods, timber, hides, ores, quinine. The sugar plantations have declined in production, but several new sugar centres are being established in the vicinity. The manufactures in-

clude candles, soap, hats, and boots. Pop. (1950) 232,488.

Maracaibo, GULF OF. Large opening of the Caribbean Sea. In N.W. Venezuela, it is connected on the S. with Lake Maracaibo. Also known as the Gulf of Venezuela, its length is 75 m. and its extreme width about 150 m. It is bounded W. by the Goajira peninsula and E. by that of Paraguaná, on which are two oil refineries. It was discovered in 1499 by the Spanish navigator Ojeda, who, having found houses built on piles, named the dist. Venezuela or Little Venice.

Maracay. City of Venezuela. The capital of the state of Aragua, it is connected by a good motor road with Carac-

cas, to which there is also a daily air service. Besides coffee and cacao, the main industries are cattle raising and dairy farming. Pop. (1950) 65,761.

Marachesti. Town of Rumania, in Moldavia. It is 12 m. N. of Focsani, and is a junction for the rly. serving the Seret valley.

A battle between the Rumanians and Russians on the one side and the Austro-Germans on the other, was fought near here in 1917. After the defeat and disintegration of the Russians in Galicia, the Germans, under Mackensen, began an attack on the line of the Sereth, which was held by Russian and Rumanian forces. On Aug. 6 Mackensen launched a heavy assault on the Russians N. of Focsani. For the next two days Russians and Rumanians combined in a sharp counter-attack

which checked Mackensen's advance, but did not prevent him from crossing the Susitsa, a W. tributary of the Sereth, capturing Panciu, and getting near the Marachesti junction rly. On Aug. 12 a great battle began to develop in the neighbourhood of Marachesti, but Mackensen was unable to break the Russo-Rumanian line. But on Aug. 28, Mackensen attacked positions held by Russian troops, who, infected with Bolshevism, retired in disorder. Rumanian forces, however, were rushed up, and on Aug. 29 put an end to his further advance. The battle of Marachesti was the greatest battle fought by the Rumanians in the First Great War, and it ended in their complete defeat of Mackensen's tremendous effort to conquer Moldavia. See Rumania.

Maragha. City of Persia, in the prov. of Azerbaijan. It stands in a cultivated plain, alt. over 5,000 ft., 20 m. E. of the S. end of Lake Urmia and 50 m. S. of Tabriz. It was the capital of Hulaku Khan, who founded an observatory near by, rendered famous by the work of Nasr-ed-din. A fine, almost transparent marble is quarried, and wine and fruit are exported. There are rock temples in the vicinity. Pop. 15,300.

Marah (Heb., bitterness). Place in the wilderness of Shur, where the Israelites found the water bitter, Ex. 15, v. 23; Num. 33, vv. 8, 9. This was perhaps at Ain Suweirah, where the springs are still impregnated with natron. The difficulty was overcome by steeping the leaves of a certain thorn in the water—a very simple method still successfully employed in the district.

Marajo OR JOHANNES. Large, low-lying island of N. Brazil. It is formed by the estuaries of the Amazon and Tocantins and their connecting arms. Swampy and liable to inundation, the W. part

bears forests of rubber-yielding trees, and is visited in the dry season by rubber gatherers and hunters.

There are some small settlements on the coast, and the island is intersected by the rivers Mapua and Anajaz. Its length is about 170 m. and its width 130 m.



Marabou. Central African member of the stork family (Ciconiidae)



Maracaibo. The Plaza Baralt in this seaport town of Venezuela, capital of the state of Zulia

Maramures Sighet OR SIGHET (Mag. Maramarossziget). Town of Rumania, in the region of Baia Mare, formerly capital of the old dist. of Maramures. It is on the Tisa (Theiss), close to the boundary between Rumania and the Ukraine, and is the centre of the salt trade of the immediate locality and the lumber trade of the Forest Carpathians.

Mar and Kellie, EARL OF. Ancient title revived in favour of the family of Erskine in 1824 and 1835. For details see Mar, Earl of.

Maranhão. State of N. Brazil. On the Atlantic, it is bounded N.W. by Pará, S.W. by Goyaz, and E. and S.E. by Piahy. The E. section of the coast-line is unbroken, but the W. portion is indented by the bays of São José and São Marcos. The Gurupy and Parnahyba form its boundaries and flow generally N.N.E.; parallel to them lie alternate ridges and valleys which open out on the coastal plain. Well forested and watered, it yields timber, vanilla, rice, cotton, sugar, tobacco, cocoa, and bananas.

Stock-rearing and gold-mining are the chief industries, and hides and rubber are exported. The capital is São Luiz. Area, 177,561 sq. m. Pop. (1950) 1,583,248.

Maranhão. Capital of Maranhão state, N. Brazil, better known as São Luiz or São Luiz de Maranhão (*q.v.*).

Marañon. Name of the upper course of the Amazon, particularly in Peru, where it rises from L. Ninocochi in the inter-Andean valley, 50 m. N.W. of Cerro de Pasco. Flowing N.N.W., almost to the border of Ecuador, it bends E.S.E. and then N.E., winding through N. Peru into Brazil. It unites with the Ucayali, or E. branch of the Amazon, at Nauta, after a course of about 500 m. through gorges in a series of rapids.

Maraschino. The name of a liqueur, so called from a particular kind of cherry. A product of Dalmatia, the best Maraschino comes from Zadar. It is distilled from cherry-pulp to which honey or sugar is added, and contains about 35 p.c. of alcohol. *Pron.* Marras-keeno.

Marash. Town of Asiatic Turkey. Called by the Armenians Kermanig, which represents its Roman name of Germanica, it lies on the side of the snow-capped Akhar Dag, 95 m. N. of Aleppo, overlooking rice-fields. The town has a large trade in carpets and embroidery. It gives its name to a vilayet, pop. (1955) 337,735.

Situated at an intersection of highways, Marash was a royal city in post-Hittite times. Stelae and reliefs from the site are at Istanbul; the hieroglyphic inscription of King Halparunda, c. 750, on the Lion of Marash enumerates his forebears for seven generations.

Marat, JEAN PAUL (1744–93). French revolutionary. Born at Boudry, Neuchâtel, May 24, 1744,



Jean Paul Marat,
French revolutionary
Musée Carnavalet,
Paris

he studied medicine at Bordeaux and Paris, and some time before 1770 moved to London, where he worked up a good practice. While in England he published his Philosophical Essay on Man, 1773, and The Chains of Slavery, 1774. His appointment in 1777 as physician to the bodyguard of the comte d'Artois took him back to Paris, where he wrote on physics and electricity.

In 1786 Marat resigned his post and devoted himself to politics, publishing in Sept., 1789, the first number of *L'Ami du Peuple*, a paper which, indifferent to party or private interests, preached an extremist gospel. Whoever reached any power or exercised any influence in the government was branded an enemy to the country—a policy which brought Marat to jail more than once, and ensured him a life of perpetual persecution. He took refuge in London, 1791–92, and on his return to Paris he was elected to the Convention, and replaced *L'Ami du Peuple* by *Le Journal de la République Française*. In this he pursued his policy of denunciation, and, having attacked the Girondins, was sent by them for trial before the revolutionary tribunal. Marat was acquitted and the Girondins fell, May 31, 1793. Six weeks later he was assassinated in his bath by Charlotte Corday (*q.v.*), July 13, 1793.

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Maratha. Variant spelling of Mahratta (*q.v.*), a people of India.

Marathon, BATTLE OF. Fought 490 B.C. between the Greeks and Persians, on the plain of Marathon,

on the N.E. coast of Attica, about 22 m. from Athens. The Greek forces, numbering 9,000 Athenians and 1,000 Plataeans, were encamped in the Varna valley overlooking the plain, separated by about a mile from a Persian army five or six times their strength.

After observing the Persian army lying by the sea, the Greeks proceeded to the attack. Their wings bore down the opposing Persian lines, but their centre was repulsed. The victorious wings, however, wheeled and, attacking the Persian centre, soon drove back the whole Persian force to the water. Most of the Persians succeeded in re-embarking in their ships, but some 6,000 lay dead on the field as compared with the Greek loss of 192 killed. The material results of the battle of Marathon were considerable, but the moral effect was infinitely greater. A victory so striking against such overwhelming odds inspired the Greeks with a confidence which was one of the most important factors in their later success.

Marathon Race. Long distance running race. It is named from the battle of Marathon, the victory having been announced at Athens by a courier, sometimes called Pheidippides, who fell dead on his arrival. The race, properly of 26 m. 385 yds., formed one of the principal events at the modern Olympic games. It has been won by S. Louis (Greece), 1896; M. Theato (France), 1900; Hicks (U.S.A.), 1904; J. J. Hayes (U.S.A.), 1908; K. K. McArthur (S. Africa), 1912; H. Kohlemainen (Finland), 1920; A. O. Stenroos (Finland), 1924; E. Ouafi (France), 1928; J. Zabala (Argentina), 1932; K. Son (Japan), 1936; D. Cabrera (Argentina), 1948; E. Zatopek (Czecho-Slovakia), 1952; A. Mimoun (France), 1956.

In 1909 indoor Marathons were held in the U.S.A. An annual Marathon race for a £500 trophy was instituted by the Sporting Life in 1909, the course being from Windsor Castle to Stamford Bridge, London. In 1909 a coaching Marathon was inaugurated in connexion with the International Horse Show in London, from the Hampton Court end of Bushy Park to Olympia, where the show is held.

Marauder. American medium bomber aircraft. It was designed by the Glenn Martin Corporation. It had two Double Wasp engines of 2,000 h.p. each, giving it a maximum speed of 280 m.p.h., a wing span of 71 ft., and carried

3,000 lb. of bombs. Known to the U.S. army as the B-26, the Marauder proved of great value in the earlier stages of the day operations over German-occupied territory. See Aeroplane illus. p. 131.

Marazion OR MARKET JEW. Market town and seaport of Cornwall, England. It stands on Mount's Bay, 3 m. from Penzance, with a rly. station. At low tide it is connected by a causeway with St. Michael's Mount, about $\frac{1}{2}$ m. distant. Fishing is the chief industry. Marazion had markets and fairs in the Middle Ages, while from 1595 to 1835 it was a corporate town, its corporation being dissolved in 1835. Its decay was partly due to the cessation of pilgrimages to St. Michael's Mount. Its alternative name has nothing to do with Jew, being derived from a Cornish word for market, Marghasyewe. Pop. 1,126. Two miles E. is St. Hilary, whose church was restored after a fire in 1853, and in the churchyard are some ancient and valuable stone monuments.

Marble. Variety of crystalline limestone of granular structure. The marbles of commerce do not all come within this definition, many non-crystalline limestones capable of taking a polish being called marbles.

Marbles are found in most countries and in most geological formations, usually in the regions of metamorphic rocks, and differ greatly in texture and colour. The colour of marble is given to it by its impurities, pure marble being snow-white, but varieties are found in all shades of colour to black. Black varieties, due to the presence of bituminous matter, are quarried in Ireland, near Kilkenny and Galway. Parian marble, the famous white marble of the ancients, is quarried in the island of Paros, and was extensively used for sculpture by the Greeks. Modern statuary work is now usually made from marble quarried at Carrara, in Italy. Pentelic marble, from Attica, quarried in ancient and modern times, supplied the stone for the Parthenon, and is whiter and more finely grained than Parian marble. The well-known Connemara marble is a beautiful green in colour, the white variety there not being a true marble. Hopton Moor marble from Derbyshire, of grey to brown tones, and taking a high polish, is widely used. Purbeck marble from Dorset is used for interior work, but is not durable when exposed.

Many highly prized varieties of marble for ornamental building

purposes owe their beauty to the presence of fossils on a ground-work of different colour, to stalagmitic formations, etc. The onyx marble of Algeria is stalagmitic, giving concentric rings of colour, when cut, of a delicate clouded yellow and brown, due to the presence of iron oxide. A similar marble is quarried at Tecali, in Mexico. Owing to its high cost, marble is used chiefly in thin slabs.

Marble, though extensively used as a building stone, does not usually stand weathering well, especially in cities, but in dry atmospheres it is extremely durable. See Carrara; Quarrying.

Marble, ALICE (b. 1914). American lawn tennis player. Born in Plumes co., Calif., she competed in first-class tennis tournaments while in her 'teens, being noted for hard hitting. She played in Wightman Cup matches from 1937, winning both her singles and doubles contests each year to 1939. She was lady champion at Wimbledon in 1939, and shared the mixed doubles championship in 1937, 1938, 1939. In America, she won the ladies' singles, 1938-40; the ladies' doubles, 1937-40; mixed doubles in 1936 and 1938-40. In 1941 she became a professional.

Marble Arch. London monument. Modelled by John Nash after the Arch of Constantine at Rome, and intended to serve as an



Marble Arch, London. North side of the arch, with the Hyde Park entrance in the background

entrance to Buckingham Palace, with which it was to have been connected by a colonnade, it was erected on its original site in 1828. Taken down in 1850, when the palace was enlarged, it was put up in 1851 at the N.E. end of Hyde Park, near to the site of Tyburn Tree, replacing a brick gateway by Soane. When the roadway here was altered in 1908 to relieve congestion of traffic, the arch was left isolated. The arch subsequently became the centre of a traffic "roundabout." The bronze gates were by S. Parker; sculptured reliefs by E. H. Bailey

and R. Westmacott. Chantrey's statue of George IV, now at the N.E. corner of Trafalgar Square, was intended for the top of the arch.

Marble Arch. Nickname given by British troops in the Libyan desert to the great marble gateway erected by the Italians about 40 m. W. of El Agheila, marking the halfway point on the coast road from Tripoli to Egypt. The medal struck by Mussolini in 1942 to commemorate the Italo-German campaign in Africa bore a reproduction of the arch.

Marblehead. Town in Essex co., Massachusetts, U.S.A. Built on a promontory with Massachusetts Bay on the E. and S. and Salem harbour on the N., it is 16 m. N.E. of Boston, and served by the Boston and Maine rly. Settled in 1629 by fishermen from Cornwall and the Channel Islands, it was separated from Salem and incorporated in 1649. In 1774 it was made the port of entry in place of Boston. Its maritime importance declined after the war of 1812. A favourite yachting resort, it claims to be the birthplace of the U.S. navy. It has a number of buildings dating from pre-Revolutionary times, e.g. St. Michael's Episcopal church (1714), and the old town hall (1727). Pop. 10,856.

Marbles. Game played by children, the name being also used for the balls of glass, stone, or clay with which it is played.

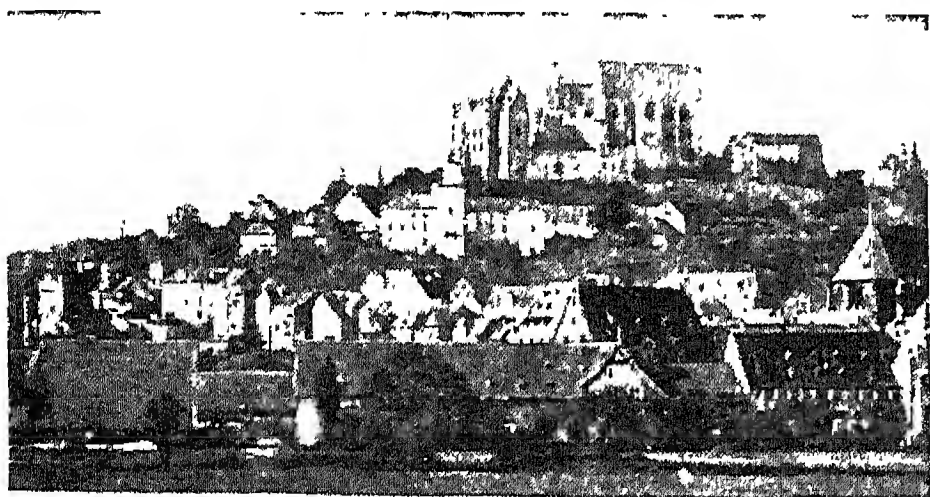
A very old game, it is said to have been known in Egypt, and it was popular, not only among children, in England during the Middle Ages and later. A number of distinct games are known to exist, and various names are given to the marbles; e.g. alley taws are the best and most expensive marbles, being made of pure

marble and enabling the player to shoot more accurately. In games in which marbles are lost and won, losses are not paid in alley taws, but in inferior balls. See Solitaire.

Marbling. Term used in book-binding for decorating the edges of books. It is produced by dipping the edge of the book into a layer of colour floating on a mucilage bath. The colours are in powder form, and are sprinkled on the surface of the bath and afterwards formed into patterns by combing and similar devices. The same process is employed in marbling paper.

Marbot, JEAN BAPTISTE ANTOINE MARCELLIN, BARON DE (1782–1854). French soldier. The son of a general, he was born in Corrèze, Aug. 18, 1782. In 1799 he joined the army and soon saw a good deal of service, and became a general in 1814, having won a reputation for leadership in Spain and Russia. He returned to France from an exile in 1819 and, again in the army, served in Algeria, appearing also in politics under Louis Philippe. He died Nov. 16, 1854. Marbot is chiefly known for his *Memoirs*, of which there is an English trans. by A. J. Butler, 1892. They give a fascinating account of the Napoleonic campaigns.

Marburg. Town of W. Germany, in the *Land* of Hesse. Situated on a bend of the river Lahn, 19 m. N. of Gressen, surrounded by



Marburg, Germany. General view of the town and castle

wooded hills and peaks, it is an old and romantic town whose main glory is the church of S. Elizabeth, an outstanding early Gothic building (1235–83) with two towers 226 ft. in height. It contains the tomb of S. Elizabeth of Thuringia and a beautiful Gothic altar. S. Mary's (13th–14th century), the Catholic church (1482), the university church (14th century), the castle on the Schlossberg (1288–1493), the German house (1400), and the town hall (1525) are also buildings of note.

Marburg university was founded in 1527 by Philip of Hesse as a centre of Protestant teaching, but the buildings are modern. It had normally about 200 professors and lecturers and up to 5,000 students. It is closely connected with the history of the Reformation, for there in 1529 Luther's and Zwingli's Marburg religious colloquy was held (*see* Lutheranism; Reformation). Marburg obtained urban rights in 1192, became in 1228 the seat of the widowed Elizabeth, and, after her canonisation, a place of pilgrimage. It gained importance as a seat of the Teutonic Order, and in the 15th to 17th centuries as residence of

the Hessian rulers. It suffered severely during the Thirty Years' War and the Seven Years' War, and became a part of Prussia in 1866. Tobacco, pottery, and wallpaper are normally produced. Taken by armour of the U.S. 1st army, March 28, 1945, it lay within the U.S. zone of occupation after the Second Great War.

Marburg. *See* Maribor.

Marcasite. Sulphide of iron, FeS_2 . It is of a metallic bronze-yellow colour, and has the same chemical composition as pyrites; but marcasite crystallises as tabular or pyramidal orthorhombic

crystals, whereas pyrites is cubic. Marcasite is found in coals, clays, and other sedimentary rocks as nodules, incrustations, and irregular masses. Jewelry is made of cut and polished marcasite. The mineral forms a source of sulphur

and is used in the manufacture of sulphuric acid and ferrous sulphate.

Marcellus, MARCUS CLAUDIUS (c. 268–208 B.C.). Roman soldier. He was five times consul and one of the most successful generals during the second Punic War. His greatest service was the capture of Syracuse after a siege of two years, in 212 B.C. He was slain in a cavalry skirmish near Venusia.

Marcellus, MARCUS CLAUDIUS (43–23 B.C.). Nephew and adopted son of the Roman emperor Augustus, and husband of his daughter Julia. He was destined to be the successor of Augustus, and his early death was deeply mourned, cf. Virgil's lines (*Aeneid*, book vi, lines 861–887).



M. Claudius Marcellus
From a bust



Marburg arms

March. Third month of the Christian calendar. The first month of the Roman calendar, it was named after Mars, originally the Italian god of the year, especially of the spring. The Anglo-Saxons called it Lencten-monath (lengthening month), from the lengthening of the days. From lencten comes the word Lent. March remained the first month in France until 1564, in Scotland until 1599, and until 1752 in England, where the legal year began on March 25. In England and Scotland the last three days of March were long considered unlucky. *See* Calendar.

March. Music designed to assist the marching of soldiers, or processions. Of military marches there are several types for the infantry, including the slow march, for funerals and other ceremonial occasions; the ordinary parade march; the quick march; and the double. Processional marches range from the simple conceptions considered sufficient in the operas of Lully to such majestic creations as Beethoven's *Marche Funèbre* in his Third Symphony, and Wagner's *Siegfried's Funeral March*. March music is usually in 2 or 4 time, but many examples of quick marches are in 6/8 time.

March. Market town and urban dist. of Cambridgeshire, England. It is 30 m. N. of Cambridge and 14 m. E. of Peterborough, in the fen district, and has an important rly. junction and the Whitemoor marshalling yards (*see* diagram pp. 5542–43), with their 40 radiating sidings. The chief industries are engineering and machinery works. Market day, Wed. Pop. 13,000.

March OR MORAVA. Tributary of the Danube, principal river of Moravia, Czechoslovakia. It rises in the Sudetic range and flows mainly S. to join the parent stream just W. of Bratislava (Pressburg). The upper course drains about 80 p.c. of Moravia, and the valley forms a wide trough between the Carpathians and the plateau of Bohemia. The lower course was at one time the frontier between Austria and Hungary; it later divided Austria from Slovakia. Its length is 210 m. Part of the river valley is known as the Marchfeld, and has been the scene of many battles.

March, EARL OF. Title borne both in England and Scotland by nobles, originally because they had charge of the marches, or the lands which lay around the boundaries between England and Wales or England and Scotland. In England the family of Mortimer pro-

vided earls of March from 1328 to 1425. In 1425, when Edward, the 5th earl, died, the estates passed to Richard, duke of York, who was a kinsman, and he and then his son Edward IV were earls of March. (See Mortimer.)

The Scottish earldom was long associated with the family of Dunbar, Patrick, 8th earl of Dunbar, being styled earl of March because of his position as guardian of the marches. The title was forfeited owing to treason in 1434. In 1619 the 3rd duke of Lennox was made earl of March, and in 1675 Charles Lennox, a natural son of Charles II, was made duke of Lennox and earl of March. The title is now used as a courtesy one by the eldest son of the duke of Richmond, a descendant of Lennox. Another earldom of March was created in 1697 for William Douglas, a younger son of the 1st duke of Queensberry. William, the 3rd earl, became the 4th duke of Queensberry, but both titles became extinct on his death in 1810. See Queensberry, Duke of.

March, ROGER MORTIMER, EARL OF (c. 1287–1330). The eldest son of Edmund Mortimer, he was made viceroy of Ireland 1316, and in 1321 joined the rebellion of Earl Thomas of Lancaster. He was imprisoned in the Tower, but, escaping to France in 1324, he there formed a liaison with Edward II's queen, Isabella, with whose aid he invaded England. Edward was de-throned and murdered, Mortimer and his paramour becoming the actual rulers. In Oct., 1330, Edward III captured them in Nottingham Castle. Mortimer was hanged at Tyburn, Nov. 29, 1330.

March, FREDRIC (b. 1897). An American film actor. Frederick McIntyre Bickel came from Wisconsin to make his stage debut in Baltimore, in 1920, and played in New York the same year. Entering films in 1928, he came to the fore in *Manslaughter*, 1931; then *Dr. Jekyll and Mr. Hyde* showed his talent for character playing. He was *Browning* in *The Barretts of Wimpole Street*; *Vronsky* in *Anna Karenina*; and the hero in *Anthony Adverse*. In 1944 the part of Mark Twain allowed him scope for comedy, and he was starred in *The Best Years of Our Lives*, 1947.



Fredric March,
American actor

Marchand, JEAN BAPTISTE (1863–1934). French soldier. He was born at Thoissey, Aisne, Nov. 22, 1863, and entered the army in 1883, gaining a commission in 1886. He explored extensively in Africa, 1888–98, and in 1898 was in command of the small French expedition concerned in the Fashoda Incident (*q.v.*). He subsequently served in China before resigning from the army. Recalled at the outbreak of the First Great War, he was given command of a brigade, being wounded in Oct., 1914, and again in Champagne in Sept., 1915, when leading his troops. He was promoted general of division in April, 1917, and gained a reputation for great personal bravery. He died Jan. 14, 1934.

Marchena. Town of Spain, in the prov. of Seville. It is 47 m. by rly. E.S.E. of Seville, and is a junction on the Cordova-Cadiz rly. A picturesque place, with decaying Moorish fortifications, it has a palace and some interesting churches, one on the site of a mosque. There



Marchena arms

are sulphur springs and baths, and a trade in agricultural produce. Pop. (1950) 20,326.

Marches (Fr. *marche*, border). Term applied to territory about the frontiers of adjoining countries, and especially to the borderland of England and Wales and of England and Scotland. The German equivalent is *mark*. Before the final conquest of Wales by Edward I the Welsh Marches comprised the greater part of south and central Wales, and were held by semi-independent English barons known as lords marchers, or *marquesses*. The marches were not divided into counties until 1536, when the authority of the lords marchers was abolished.

The borderland of England and Scotland was divided into the western and middle marches, each with a governor styled the warden of the marches, and a court intended to settle by peaceful methods the disputes between the people on either side of the border that had formerly resulted in mutual raids and forays. The word is also applied in Scotland to the borders of burghs and estates, and from early times the riding of the marches and the common-riding was an annual custom incumbent upon the bur-

gesses, in order to maintain their rights to the common lands and prevent the seizure and enclosure of these by the feudal barons.

Marches. A maritime region of N.E. Italy, situated between the Apennines and the Adriatic. It comprises the provs. of Ancona, Ascoli Piceno, Macerata, and Pesaro e Urbino. The principal products are limestone, sulphur, maize, tobacco, wine, silk, straw-plait, and paper. Formerly a papal possession, it was annexed in 1860 by Victor Emmanuel, and later incorporated in the kingdom of Italy. Area, 3,742 sq. m. See Picenum.

Marchesi, MATHILDE (1826–1913). Teacher of singing. She was born at Frankfort-on-Main, March 26, 1826, and studied in Vienna, and Paris, thereafter having considerable success on the concert platform. In 1852 she married Salvatore Castrone, Marchese della Rajata, Palermo, who as Salvatore Marchesi became famous as a baritone singer and teacher of singing. With her husband, she taught singing at the Vienna conservatoire, 1854–61, at Cologne, 1865–69, and later settled in Paris. Her publications include *École de Chant*, a series of books of Vocalises; in English, *Ten Singing Lessons*, 1901, and an autobiography, *Marchesi and Music*, 1897. She died Nov. 18, 1913.

Her youngest child, Blanche Marchesi, who became the wife of Baron Caccamisi, was educated at Vienna, Frankfort, and Paris, studied singing under her mother, and herself began to teach at the age of 15. She began her career as a singer at Berlin in 1895, singing thereafter in opera, oratorio, and on the concert platform.

March Hare, THE. Character in Lewis Carroll's *Alice in Wonderland*, where he figures in the famous tea-party. The proverb, mad as a March hare, has its origin in the fact that hares are wilder in March, the breeding season, than at other seasons. See *Alice's Adventures* illus.

Marchienne-au-Pont. Town of Belgium, in the prov. of Hainaut. It lies in the Sambre valley, 2½ m. by rly. W. of Charleroi, and is an important centre of the coal, iron-working, and engineering industries of the Charleroi area. Glass also is manufactured. Population 22,000.

Marchioness. Feminine of marquess (*q.v.*). The Marchioness is the nickname of a character in Dickens's novel *The Old Curiosity Shop*. The ill-used, half-starved maid-of-all-work to Sally and

Sampson Brass is called the Marchioness by Dick Swiveller, who teaches her to play cards and gives her an interest in life. She nurses him through a serious illness, and he eventually makes her his wife.

Marcion. Founder of an heretical sect known as Marcionites. He lived in the 2nd century, was a son of a bishop of Sinopē, and was influenced by Docetic Gnosticism. He taught that there was one true God, unnameable and invisible; that the world was created by the Demiurge, identifiable with the Jewish Jahveh; and that the Devil held an intermediate position between the true God and the Demiurge. Christ had not a real body, otherwise He would have connected Himself with matter, a thing essentially evil. The O.T. proceeded from the Demiurge. Of the N.T. Marcion accepted only those parts he regarded as uncorrupted by Judaism. He taught three baptisms for sin, believed in transmigration, denied the resurrection of the body, and advocated extreme asceticism. Tertullian wrote five books against him.

Marcomanni. Teutonic tribe that flourished in the first centuries of the Christian era. The name means men of the border or mark. Under their king Maroboduus, who promoted Roman civilization, they extended their dominions from the neighbourhood of Ratisbon (Regensburg) to Bohemia and Moravia. They shared in the great struggle with the Romans, known sometimes as the Marcomannic War, which lasted from 167 to 180, when Commodus bought them off. They were afterwards absorbed by the Bavarians.

Marconi, GUGLIELMO, MARQUIS (1874-1937). Italian scientist and inventor. Born near Bologna, Italy, April 25, 1874, of Italian and Irish parents, and educated at the university there, he became interested in the discoveries by Hertz regarding the possibility of wave transmission. He improved existing attempts to make use of the Hertzian waves, notably in the Onesti and Branly coherers, and carried out experiments in 1895-96. Then he submitted his inventions to the British government. In 1897 the Marconi Wireless Telegraph Company was founded, and in 1899 signals were transmitted across the English Channel. Marconi developed a military transmitting and receiving set which was used successfully by the British army in the S.

African war. In Dec., 1901, communication was established between Cornwall and Newfound-



Guglielmo Marconi,
Italian scientist

land, and a rapid advance was made in methods of communication with ships at sea. By 1903 commercial messages were being transmitted to America by wireless. In 1910-11 Marconi invented a new valve receiver and a new detector, developed a duplex system of transmission, and installed his apparatus in most large ocean-going liners.

During the First Great War he was in charge of all radio operations for his government, and introduced radio direction-finding, whereby the position of a stationary or moving transmitter could be plotted and fixed by listening stations. In 1917 he went to America as member of an Italian mission, and in 1919 was a delegate to the Paris peace conference, signing treaties with Austria and Bulgaria.

While experimenting with short waves in 1924, he invented the beam system for long-range transmission which eventually was adopted for the British post office radio telegraphy services to Canada, S. Africa, India, and Australia. In 1934 he introduced an ultra-short wave device to enable ships to enter and clear port in dense fog.

Until the advent of fascism, Marconi took little interest in politics, but in 1923 he joined the fascist party and, becoming a close friend of Mussolini, was appointed a member of the grand council and in 1929 a marquis. During the Abyssinian war he was an ardent propagandist. In 1905 he had married Beatrice O'Brien, daughter of Lord Inchiquin; the union was dissolved in 1927, when he married Countess Bezi-Seali. Marconi's numerous scientific honours included a share of the Nobel prize for physics in 1909, the Albert medal of the Royal Society, and the Kelvin medal. He was made honorary G.C.V.O. in 1914 and an Italian senator in 1915. *Consult* M., *Master of Space*, B. L. Jacob and D. N. B. Collier, 1935; M., *The Man and his Wireless*, O. E. Dunlop, 1937.

Marconi Inquiry. Political incident of 1913. It arose from the British government's proposed contract with the Marconi Co. for

the building of a chain of Empire wireless stations. Rumours spread that members of the government were financially interested in the company. Sir Rufus Isaacs (later Lord Reading), attorney-general, and Herbert (later Lord) Samuel, p.m.g., brought a libel action against a Paris newspaper, which withdrew its charges when it was shown that these ministers had dealt only in shares in the American Marconi Co. A select committee was appointed by the govt. and by parliament to inquire into the matter. The Marconi Co. withdrew from the contract in which, however, the committee could find nothing reflecting against the government's integrity. But a minority report criticized the conduct not only of the attorney-general and the p.m.g., but of the chancellor of the exchequer (D. Lloyd George) and the government chief whip (the Master of Elibank), who had also dealt in the American company's shares. After a debate the house accepted expressions of regret from the ministers.

Marcus Aurelius (121-180). Roman emperor 161-180. Marcus Annius Verus, who, as the adopted

son of the emperor Antoninus Pius, bore the name of Marcus Aurelius Antoninus, is regarded as representing the perfect ideal of the highest pre-Christian conception of character. Drawn from the study of Stoic philosophy to discharge the functions of the Platonic philosopher-king as ruler of the civilized world, he loyally exerted himself to the uttermost.



Marcus Aurelius,
Roman emperor
From a bust

Unlike Antoninus Pius, he was not to enjoy peace. In the East the Parthians fell upon his borders. Thither in 161 he sent his young colleague Verus. The Parthians were beaten, not by the incapable Verus, but by Avidius Cassius. Across the Rhine and the Danube, Germans and Dacians rose in revolt, and Italy itself was smitten with pestilence. To appease the gods, offended by the decay of religion, Marcus enacted solemn purifications and intercessions. His hand fell heavily upon the Christians, to whose doctrines the wrath of Heaven was in part attributed. Then in 168, though he had no experience in war, he as a matter of duty placed himself with Verus at the head of the

legions. Without apparent reason the tribes of the upper Danube made their submission, without striking a blow. But the submission had been only temporary. From this time, on one frontier or another, Marcus, whose colleague died in 169, was summoned to suppress barbarian risings, and even a rebellion raised in 175 by Avidius Cassius in the east.

The emperor's campaigns were conducted conscientiously and successfully, though without any remarkable display of military talent; the most notable event was a famous battle in which his legions were saved from destruction by an extraordinary storm which created a panic among the opposing forces—a storm variously attributed to the prayers of a Christian legion, and to the virtues of the emperor. In victory Marcus displayed an unfailing magnanimity; but his victories were won at the cost of concessions, which permitted large numbers of barbarians to settle in Roman territory, and greatly hastened the tendency to multiply the barbarian contingents in Roman armies. His weakness found unfortunate expression in his blindness to the vices of his son and successor, Commodus, and possibly of his wife Faustina, though her character has been variously judged. Marcus died on March 17, 180, at the close of a successful, but by no means conclusive, campaign in the regions of the upper Danube. Apart from his great and uncongenial work as emperor and the nobility of his public life, Marcus won a permanent place in the affection of all pious and contemplative souls by placing on record his *Meditations*, the noble thoughts of a spirit pure and sincere. *Consult* Lives, E. Renan, Eng. trans. W. Hutchinson, 1904; C. C. Dove, 1930; F. H. Hayward, 1935.

Mar del Plata.

The Brighton of Argentina, in the prov. of Buenos Aires. Near Cape Corrientes, and 230 m. S.E. of Buenos Aires, it is visited in the summer season by 500,000 people. It has many fine hotels, and other attractions include the casino, fishing, golf, polo, and horse racing. Pop. est. 85,000.

Mardi Gras. Festival held on Shrove Tuesday in Paris. The festival, which has been long established, derives its name from the fat ox which is led in procession through the streets of Paris on that day, followed by the triumphal car of a child, nicknamed the king of butchers. A similar festival is held in Italy, and in New Orleans, U.S.A. *See* Carnival; Lent.

Mardonius (d. 479 B.C.). Persian general and son-in-law of Darius the Great, king of Persia. He commanded the first expedition against Greece, but his land forces suffered heavily at the hands of the Thracians, while his fleet was almost wholly lost in a storm. In the second Persian expedition under Xerxes, Mardonius acted as lieutenant to the king, and was left behind after the defeat at Salamis with an army of 300,000 men. He was defeated and slain at Plataea in 479 B.C.

Marduk. City god of Babylon. When an Amorite dynasty, in the 19th century B.C., established the supremacy of Babylon, Marduk appropriated the prerogatives of older Sumerian gods, especially Enlil. His worship was centred in the Esagila temple at Babylon, where also his consort Sarpanitum was worshipped. Originally the vernal sun, he became lord of life, light, war, magic, and healing. In Neo-Babylonian times he was often called Bel, "the Lord."

Mare Clausum (Lat., closed sea). Name of a book written by John Selden in 1636. In 1609 Grotius had written his *Mare Liberum*

(free sea), in which he attempted to show that all men have the right to use the seas freely. To this Selden replied that the English nation had special rights in the narrow seas that engirdle the British Isles. The latter doctrine has been abandoned, and territorial waters are now restricted to a three-mile limit from the shore.

Maree. Loch or lake of Scotland. In the county of Ross and Cromarty, it is about 21 m. W. of Kingwall. Fringed for much of its circuit with lofty mountains, it forms one of the most magnificent pieces of scenery in Scotland. The lake is $13\frac{1}{2}$ m. long, has a breadth varying from $\frac{1}{2}$ m. to 2 m., and covers 11 sq. m.

Maremma. Former marsh land of Tuscany, Italy. A coastal tract on the Tyrrhenian Sea, it extends from Piombino to Orbetello and penetrates inland to a depth of from 15 m. to 20 m. Well drained in ancient times, it was prosperous until the underground canals fell into disrepair, and in spite of recent attempts at reclamation, it long remained a malarious forsaken district, until under the fascist régime it was drained once more.

Marengo. Village of N. Italy. It lies S. of the Po, 2 m. S.E. of Alessandria. It is famous for the battle, one of Napoleon's greatest victories, fought between the French and the Austrians, June 14, 1800.

The Austrian army in N. Italy, in the spring of 1800, was about 100,000 strong, but it was divided, only a portion watching for a French advance. Napoleon assembled his army of 40,000 men in Switzerland, led it secretly across the S. Bernard, and on June 2 entered Milan, thus cutting off the Austrians from their homeland. His next move was to find the enemy, but his information was not very accurate, and a good part of his force was scattered in search



Maree, Scotland. View of the loch and islands, from near Talladale



Marduk destroying the monster Tiamat or Chaos. From an Assyrian bas-relief in the British Museum

when the Austrians, under Count Melas, advanced from Alessandria to Marengo, where was the main French army.

The French, outnumbered, put up a stout fight when the Austrians advanced across the Bormida. They were forced, however, to retreat, and were falling back rapidly when at 11 a.m. Napoleon arrived. The rearward movement was continued, on the whole in good order, and the Austrians about 3 p.m. regarded the battle as won. But suddenly came a change. Recalled by Napoleon, Desaix and his division reached the field and an attack was organized. All the available guns were brought into action. Desaix advanced from Marengo, while the cavalry charged on the right flank of the enemy. The Austrians soon broke and fled. The French lost about 4,000 men, including Desaix; the Austrians about 9,000; the main consequence of the victory was the cession of N. Italy to France. See Napoleon.

Mare Nostrum (Lat. our sea). Term used by the Romans for the Mediterranean Sea when they were masters of the countries bordering it. Before the Second Great War Mussolini in his propagandist speeches expressed his intention of making the Mediterranean an Italian lake, or *mare nostrum*, assuring the people that no enemy force would be allowed to exist there or to traverse it in the event of war.

Mare's-tail (*Hippuris vulgaris*). Aquatic perennial herb of the family Haloragaceae. It is a native of temperate and cold regions of the N. hemisphere. It has a stout rootstock which creeps in lakes and ponds, sending up slender, many-jointed stems, closely invested with whorls of slender leaves. The minute flowers are green, with red anthers but no petals.

Mares' tails is a term popularly applied to high cirrus cloud when it appears in tufts. See Cloud.

Mareth Line. System of defences some 20 m. long constructed in Tunisia by the French between the First and Second Great Wars as a defence against possible Italian attack from the E., Tunisia being one of the French possessions vociferously claimed by Mussolini. It took its name from the town of Mareth through which it passed.

The line occupied a series of wadi (watercourse, usually dry) edges and hillocks across the plain from the coast near Zarat to the Matmata hills, among which it ended. After the defeat of France in June, 1940, the Italians took possession of it, and altered it as far as possible to make it defensible against attack from the W. When the Germans and Italians were retreating before the British 8th army in 1942-43, a good deal of work was put into strengthening it. The strongest part of the line ended some 10 m. from the coast, from which point to the sea the natural difficulties of the country had simply been strengthened by occasional pillboxes, barbed wire, and minefields.

After the capture of Medenine, Feb. 18, 1943, Montgomery paused until the middle of March to build up his forces. Rommel had gone back sick to Germany, and the German-Italian army, now occupying the Mareth line, was under the command of the Italian general Giovanni Messe, who, determined as he told his troops to show "those German swine who retreat that we can fight better than they," put up a stubborn defence. The enemy was, however, driven from his outposts on the S. of the wadi Zigzau, which formed a natural anti-tank ditch before the line, during the nights of March 16 and 17. The main attack began on March 20. The wadi was conquered, but there the advance was held. In the meantime Gen. Freyberg (*q.v.*) was leading a column of British and French armour, New Zealand and Greek infantry, round the Axis right flank through the desert to the W. of the Matmata hills. Moving with great speed, this column reached El Hamma, some 35 m. N.W. of Mareth, 20 m. W. of Gabes, on March 27, capturing it after violent fighting two days later.

To escape encirclement Messe abandoned the Mareth line on March 28 and retreated rapidly beyond Gabes to the wadi Akarit. See North Africa Campaigns.

Marett, ROBERT RANULPH (1866-1943). British anthropologist. A Jerseyman, born June 13, 1866, he was educated in the island at Victoria College, and at Balliol, Oxford. In 1891 Exeter College, Oxford, elected him fellow and

lecturer in philosophy; and he was its rector from 1928 until his death, Feb. 18, 1943. He held a readership in social anthropology, and during 1913-18 was president of the Folklore Society. Marett's province was anthropology in relation to philosophy, and he showed their connexion in *The Birth of Religion*, 1909; *Psychology and Folklore*, 1920; *The Diffusion of Culture*, 1927. An engaging autobiography, *A Jerseyman at Oxford*, appeared in 1941.

Margam. Part of the bor. of Port Talbot, Glam, Wales. It is a coal-mining centre, and has a steel-works, largest in Europe when opened in 1951. Near by is Margam Abbey, residence of the Talbot family until 1921; it contained some magnificent works of art. In the park is a conservatory over 300 ft. long, containing a splendid collection of orange, lemon, and other trees. It stands near the ruins of a Cistercian abbey, founded in 1147. Margam church, dedicated to the Virgin Mary and restored in the 19th century, was originally the abbey church. Margam Hill is about 800 ft. high.

Margaret. Feminine Christian name. It is derived through the Greek from a Persian word meaning a pearl. Very popular in most European countries, it has many variants, among them Margarita, Marguerite, and the many forms of Margery or Marjorie.

Margaret was long a popular name for princesses in England, Scotland, and France. In addition to those noticed separately, mention may be made of Henry III's daughter Margaret (1240-75), who married Alexander III of Scotland, Dec. 26, 1251, and through her daughter, another Margaret, was the grandmother of the Maid of Norway; of Edward I's second wife, Margaret (c. 1282-1318), daughter of Philip III of France; of James I of Scotland's daughter Margaret (c. 1425-1445), who married Louis XI of France, in 1436, both being children; she is the princess who is said to have kissed the sleeping poet, Alain Chartier; and of James III of Scotland's wife Margaret (d. 1486), daughter of Christian I, king of Denmark. Another was the countess of Richmond and Derby, and the mother of Henry VII. The daughter of the duke of Somerset, she was the benefactress who is immortalised at Oxford and Cambridge as Lady Margaret.

Margaret (c. 1045-93). Saint and Scottish queen. The daughter of Edward, a son of the English



Mare's-tail. Stems and leaves of this aquatic plant

king, Edmund Ironside, she was born in exile, probably in Hungary. Her father died young, and the princess, having returned to England with her brother Edgar Atheling, took refuge with the king of Scots. About 1067 she was married at Dunfermline to King Malcolm III. In Nov., 1093, her husband and eldest son were killed in battle with the English, and on the 16th the queen died in Edinburgh. Three of her sons, Edgar, Alexander I, and David I, became kings of Scotland. Margaret won great esteem in Scotland by her charity and piety. She was canonised in 1250; her festival is Nov. 16 in Scotland, June 10 elsewhere.

Margaret (1430-82). Queen of Henry VI of England, known as Margaret of Anjou. Born March 23, 1430, the daughter of René of Anjou, duke of Lorraine and titular king of Sicily and Jerusalem, she was married to Henry at Titchfield Abbey in April, 1445. Her friendship with the De la Poles made her many enemies, and she made her position more difficult by interference in politics and her association with Somerset against Richard of York. In 1453 her son Edward was born, and during the fit of madness which attacked her husband, 1453-55, Margaret did her utmost to thwart York. The Wars of the Roses broke out, and after a series of defeats and victories, ending in the second battle of St. Albans, 1461, she retired to France. Allied to Warwick, she returned to England, and after her defeat of Tewkesbury, 1471, was made prisoner. Liberated after five years, she returned to France, and died April 25, 1482. *See* Henry VI; *Roses*. Wars of the; *consult* Life, M. A. Hookham, 1872.

Margaret (1283-90). Queen of Scotland, called the Maid of Norway. The daughter of Eric II of Norway, and Margaret, daughter of Alexander III of Scotland, she was declared heir to the Scottish throne in 1284. In 1286 her grandfather was killed and she became nominally queen. She remained in Norway until 1290, when, a marriage having been arranged between her and the future English king, Edward II, she was sent to Scotland, but died on arriving at Orkney in Sept.

Margaret (1489-1541). Queen of Scotland. Eldest daughter of Henry VII of England, she was born Nov. 29, 1489. In Aug., 1503, after protracted discussions about policy and dowry, she was married to James IV of Scotland, this being



Margaret, British princess, younger sister of Queen Elizabeth II

the alliance which led to the union of England and Scotland under James VI. In 1513 her husband was killed at the battle of Flodden, and Margaret became regent for her child James V. In 1514 she married Archibald Douglas, earl of Angus. The regency was taken from the queen, who sought refuge in England. For a time she remained there, now trying to get a divorce from her husband, but soon she was again in Scotland, active in the interests of her son. The divorce obtained, in 1527 she married Henry Stewart, who was made Lord Methven. She died at Methven Castle, Oct. 18, 1541.

Margaret (1353-1412). Queen of Denmark, Norway and Sweden. The daughter of Valdemar IV of Denmark, she was married at the age of ten to Haakon VI of Norway. On his death, 1380, she became queen of that country and on the death of her son Olaf, 1387, became queen of Denmark as well. Shortly after she was invited by some of the Swedish nobles to accept their crown: this she did, her army defeating the Swedes under King Albert in 1389. By the union arranged at Kalmar, the three Scandinavian kingdoms were brought under one rule, which Margaret continued to exercise until her death, Oct. 28, 1412. *Consult* Margaret of Denmark, M. Hill, 1898.

Margaret OR MARGUERITE. (1553-1615). Queen of France. Marguerite de Valois, daughter of Henry II and Catherine de' Medici, born May 14, 1553, in 1572 was married to Henry of Navarre, afterwards Henry IV, the ceremony being marked by the massacre of St. Bartholomew. She was divorced in 1599 and died in Paris,

March 27, 1615. Cultured and beautiful, yet licentious and extravagant, Margaret had several lovers. She wrote poems and some *Memoirs* (English translation, Violet Fane, 1892). She is La Reine Margot of romance.

Margaret (b. 1930). British princess. The second daughter of King George VI and his consort Elizabeth, she was born at Glamis Castle, Aug. 21, 1930, and christened Margaret Rose. She is next in the line of succession to the throne after her sister Queen Elizabeth II and the latter's issue.

Margaret OR MARGUERITE (1492-1549). French princess. Margaret of Angoulême was the daughter of Charles of Orleans and the elder sister of Francis I. Born at Angoulême.

April 11, 1492, she married in 1509 Charles, duke of Alençon, and after his death, Henry king of Navarre. She died Sept. 21, 1549, leaving a daughter, Jeanne, who became the mother of Henry IV. Margaret is best known for her interest in literature. Her court was the resort of poets and she herself wrote poems. Her best-known work is the *Heptameron*, stories on the lines of Boccaccio's masterpiece. Her niece another Marguerite (1523-74), daughter of Francis I, was also known for her interest in literature. She married Emmanuel Philibert, duke of Savoy. *See* Women and Men of the French Renaissance, E. Sichel, 1901.

Margaret (1446-1503). Duchess of Burgundy. The daughter of Richard, duke of York, and the sister of Edward IV, she was born at Fotheringay, May 3, 1446. On July 3, 1468, she was married at Damme to Charles, afterwards duke of Burgundy. In the Netherlands Margaret was a staunch friend to her brother and his cause, and during her long widowhood (1477-1503) her interest in English affairs was continuous. She aided Edward to recover his throne in 1470, and after the succession of Henry VII never ceased in her attempts to overthrow him.

Margaret (1522-86). Duchess of Parma, and regent of the Netherlands. A natural daughter of the emperor Charles V, in 1533 she married Alessandro de' Medici, duke of Florence and after his death, Ottavio Farnese, duke of



Margaret of Angoulême

Parma. A capable and fearless woman, when Philip II gave her the regency of the Netherlands, in 1559, she showed herself a strong and intelligent ruler, but she was unable to cope with the revolt which broke out in 1566, and in 1567 she retired to Italy.

Margarine (Gr. *margaron*, pearl). Name of an edible fatty food, defined by the Butter and Margarine Act, 1907, as "any article of food, whether mixed with butter or not, which resembles butter and is not milk-blended butter." Other enactments limit the proportion of butter in margarine to 10 p.c., and the water to 16 p.c. To comply with the requirements of the Food and Drugs Act, 1938, and the Emergency Laws (Transitional Provisions) Act, 1946, margarine when exposed for sale must be labelled with the name, and the outside wrapper must show the word margarine in letters as large as any others. Margarine for table use is usually enriched in vitamins up to 450-550 I.U.s vitamin A and 90 I.U.s vitamin D per oz. (See Irradiation; Irradiation of Foodstuffs.)

The margarine industry owes its origin to a prize offered in 1867 by Napoleon III for an artificial butter substitute which should conform as closely as possible physically and chemically with butter, but which would be cheaper and

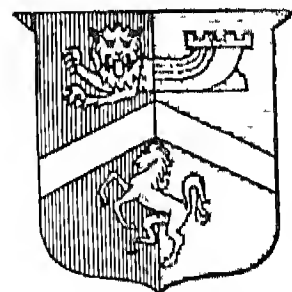
hard (hydrogenated) fats and soft oils made possible by hydrogenisation, whereby liquid oils can be hardened to a solid white fat by the action of hydrogen. Thus a hard white fat is obtained from whale oil.

Relative proportions of animal and vegetable fats used depend upon the quality and texture desired, and upon the price, animal fats being generally more expensive. The vegetable fats undergo a purification which renders them tasteless, odourless, and colourless. The milk used is either fresh-skimmed or separated; it is introduced to impart the butter flavour and to emulsify the fats. Powdered milk is sometimes used instead of liquid milk. Flavour is enhanced by the addition of butyric and other cultures. In Great Britain a small quantity of colouring matter is added, but in some countries this is prohibited, and margarine is white. To its original colour it is sometimes stated that it owes its name.

Manufacture begins in an emulsifying machine known as the margarine churn, in which the milk, melted fats, and vitamin A and D concentrates are agitated at a strictly controlled temperature until an emulsion is formed. This must then be chilled, crystallised, kneaded, blended, and automatically weighed and wrapped.

coast of Venezuela, is about 19 m. across. Margarita was discovered by Christopher Columbus in 1498. Pop. 70 000. It is famous for its pearl fisheries and hand-made straw hats. It also exports fruit and tobacco.

Margate. Mun. borough, watering-place, and seaport of Kent. In the isle of Thanet, it is 15 m. N.E.



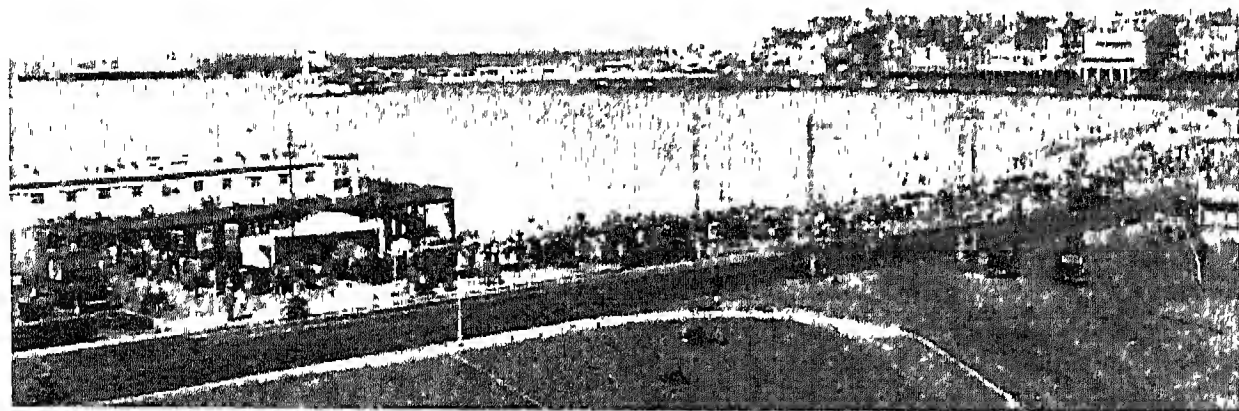
Margate arms

from Canterbury and 74 from London, with three rly. stations. It is also connected with London by regular steamboat and road coach services. It is a member of the Cinque port of Dover, but is chiefly known as a pleasure resort, the air being remarkably bracing. It has a jetty, a pier, a theatre, winter gardens, good sands, and a fine esplanade. The chief church is S. John the Baptist, of which some of the original Norman work remains. Holy Trinity church was destroyed during an air raid in the Second Great War; its tower, left standing for some years, was eventually demolished. Dane Park is a public pleasure ground. The borough includes the townships of Westgate-on-Sea and Birchington. The E. end of the town is called Cliftonville, and the central area Westbrook.

The town has an internal transport system, organized by the E. Kent Road Car Co., which maintains bus connexions with Broadstairs, Ramsgate, and other places of interest in Thanet and E. Kent. Margate was originally a fishing village and a small port. Towards 1800 it became a watering-place; in 1857 it was made a borough. Pop. (1951) 42,512.

Margaux. Town of France, in the dept. of Gironde. It is 16 m. N. of Bordeaux, with which it is connected by rly. On the W. shore of the Gironde estuary, it is noted for its Médoc wines. Pop. (1954) 1,307.

Margesson, HENRY DAVID REGINALD MARGESSON, 1ST VISCOUNT (b. 1890). British politician. Educated at Harrow and Magdalene College, Cambridge, he was elected Unionist M.P. for Upton division of West Ham, 1922, and for Rugby, 1924. A junior lord of the treasury, 1926-29 and 1931, he was made parliamentary secretary to the treasury and government chief whip in 1931. The strictness of his disciplinary practice in the latter capacity aroused some resentment and criticism, and was occasionally the object of scorn



Margate, Kent. Harbour, pier, and promenade of this S.E.-coast resort. Its lighthouse was destroyed by high seas early in 1953

keep better. The prizewinner in 1869, a French chemist, Mège-Mouriès, worked out a manufacturing process in which fresh beef fat was digested with a weak alkaline solution in the presence of pepsin. The resulting mixture, cooled, churned with milk, and pressed was sold in Paris as oleo-margarine.

After 1910 vegetable oils and fats, e.g. those derived from coconut, palm kernel, ground-nut, cottonseed, soya bean, kapok, maize, and sunflower, gradually replaced the exclusive use of animal fats.

A more recent development is the blending in correct proportions of

In Great Britain the margarine industry is principally centred in the Thames and Mersey districts.

Margarita. Island in the Caribbean Sea, belonging to Venezuela. It lies off the N.E. coast of Venezuela, and with several adjacent islands forms the state of Nueva Esparta. Its length is 44 m and its breadth varies from 5 m to 20 m. Composed of two mountainous portions connected by a low isthmus, its highest point is over 4,000 ft. in alt. The capital is Asunción (*q.v.*), and the chief port is Pampatar, with a fair harbour. The strait of Margarita, which separates the island from the

among the opposition. Created a privy councillor in 1933, Margesson was secretary of state for war 1940-42. He was created a viscount in 1942.

Marghilan OR MARGELAN. A town of Uzbek S.S.R. in Ferghana region. It is 8 m. N.N.W. of Ferghana town and has been a silk spinning and weaving centre since the 10th century. It is the traditional burial-place of Alexander the Great. Pop. (est.) 45,000.

Marginal Theory. In economics, the theory that the individual's ideas concerning value, and hence the desirability of economic action, are determined by the margin or the next increment. The marginal utility of a commodity at any time to a person, that is, the subjective value of it to him, depends on his ideas concerning an additional increment. The marginal demand price is the amount that he is just willing to pay to obtain an additional increment. The marginal production of any commodity is that which is just profitable to certain producers at a stated price. The business man tries to ensure that the marginal revenue from extra business shall exceed the marginal costs. The higher the price for a commodity, the lower is the margin of production; on the other hand, a higher price raises the marginal demand, that is, excludes those who were previously just willing to buy.

Margrave (Ger. *Markgraf*). German title meaning count of the maren, or border, corresponding to marquess. It was at first applied under Charlemagne to governors of frontier districts. The word, which soon lost its original meaning, was long used as a secondary title by German sovereign princes. The feminine form is margravine.

Marguerite. Name applied by florists to several plants of the family Compositae. Originally belonging to the daisy (*Bellis perennis*), and sometimes used for the ox-eye daisy (*Chrysanthemum leucanthemum*), it is more generally applied in gardens to *C. frutescens*.

Marguerite de Valois. See Margaret (1553-1615).

Margueritte. Name of two brothers, Paul (1860-1918) and Victor (1866-1942), French authors who achieved particular success in collaboration. Paul, born at Laghouat, Algeria, Feb. 1, 1860, who entered the ministry of instruction as a clerk, in 1884



Paul Margueritte.
French writer

published *Mon Père*, embodying his father's letters. His first novel, *Tous Quatre*, 1885, was followed by *Amants*, 1889, and *Ma Grande*, 1891. *Souvenirs de Jeunesse* appeared 1906-08; *La Flamme* in 1909. He died at Hosségor, near Cap Breton, Landes, Dec. 30, 1918.

In collaboration Paul and Victor produced *Le Pariétaire*, 1896; *Le Carnaval de Nice*, 1897; *Une Époque*, four vols. of striking stories of the Franco-Prussian War; and a number of other novels, most of them historical. Victor's best known work on his own was *La Garçonne*, 1919; he published a life of Briand in 1932.

Mari. Ancient city of Mesopotamia, on the r. Euphrates near its junction with the Khabur. French archaeologists working on the site Tell el Hariri, found fine Sumerian statues and successive building remains including houses, temples, and the great frescoed palace of Zimrilim, ruler of Mari at the zenith of its prosperity. The palace archive, many thousands of tablets referred to today as the Mari Letters shed much light on the period between c. 1800 and 1760 B.C. when Mari was first a province of old Assyria and then an independent and powerful kingdom. Zimrilim's city was destroyed c. 1760 B.C. by Hammurabi (*q.v.*) of Babylon. Consult Mari, une ville perdue, A. Parrot, 1948.

Mari. A.S.S.R. of the R.S.F.S.R., in east European Russia. It is bordered by Gorky and Kirov regions and Tatar and Chuvash A.S.S.R.s. Yoshkar-Ola is the capital. The Volga crosses it in the S.W. and forms part of its southern boundary; it is drained also by the Vetluga and other tributaries of the Volga. Forests of fir, pine, and a few deciduous trees cover 60 p.c. of its area of 8,900 sq. m.; lumbering, saw-milling, and other woodworking are the chief occupations. There is some agriculture in the N.E. About half the pop. (est. 600,000) are of Mari stock, a Finno-Ugric people, 44 p.c. Russian, the rest Tartars, Udmurts, etc. Mari was made an autonomous region 1920. an autonomous republic 1936.

Maria Christina. Name of two queens of Spain usually called Christina (*q.v.*).

Mariamne (d. 28 B.C.). Second wife of Herod I, the Great, and grand-daughter of Hyrcanus II. She was put to death by Herod in a fit of jealousy. She is the subject of tragedies by Alexandre Hardy, 1610; and Voltaire, 1724.

Marianne Islands. Archipelago of the N.W. Pacific Ocean, also called Marianas or Ladrones. They lie N. of the Carolines and about 1,500 m. E. of the Philippines. Those to the N. are mountainous and uninhabited; those to the S. are flat and low-lying, the chief being Guam (*q.v.*), which was ceded by Spain to the U.S.A. in 1898. Saipan, Tinian, and Rota. The climate is warm and moist, and the islands produce rice, maize, cotton, sugar, tobacco, and coffee. They were discovered by Magellan in 1521, and were called 'thieves' (Sp. *ladrones*) islands. Spain sold them (except Guam) to Germany in 1899 for £840,000. After the First Great War, the German islands were mandated to Japan, which, against the terms of the League of Nations mandate, heavily fortified them.

During the Second Great War, Guam was captured by the Japanese Dec. 9-13, 1941. On June 15, 1944, U.S. Marines landed on Saipan; Garapan, the capital was captured on July 3; organized resistance ceased July 9. U.S. casualties were heavy: 2,359 killed, 11,481 wounded, 1,218 missing; most of the Japanese garrison of 19,000 perished. U.S. amphibious forces landed on Guam July 20; organized opposition ceased Aug. 10. The conquest of Tinian took from July 23 to Aug. 7. Japanese troops in Rota I. surrendered Sept. 2, 1945.

The Marianne Is. (other than Guam) were placed by the U.N. under U.S. trusteeship in 1947.

Marianske Lazne. Czech name of Marienbad (*q.v.*).

Maria Theresa (1717-80). Archduchess of Austria, wife of the emperor Francis I. Born in Vienna, May 13, 1717, daughter of the emperor Charles VI, in 1736 she married Francis of Lorraine, who in 1738, in exchange for Lorraine, was made grand-duke of Tuscany. In 1740, Charles VI died, leaving no son. By the pragmatic sanction, 1713, he had made his personal possessions heritable in the female line failing a direct male heir; and Maria Theresa claimed the Hapsburg inheritance—while it was sought to secure the imperial succession for her husband. But there were other claimants, the chief being Charles

Albert of Bavaria, who procured his own election as emperor. Frederick the Great on his own account seized the province of Silesia, and Europe was plunged in the war of the Austrian Succession. A striking incident was the manner in which the Hungarians, whose loyalty to the Hapsburgs had been extremely doubtful, rallied in support of their courageous young queen. Before the war was ended in 1748 by the peace of Aix-la-Chapelle, Charles Albert died, and Francis of Lorraine was elected emperor as Francis I. At the peace, Maria Theresa had to submit to the loss of Silesia.

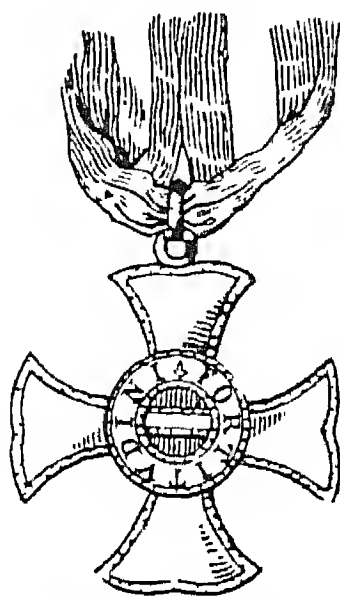
The recovery of Silesia and the punishment of Frederick of Prussia now became the great objects of her life. During the ensuing years her minister, Kaunitz, reconstructed the system of European alliances in order to crush Frederick, who anticipated the attack and opened the Seven Years' War by invading Saxony in 1757 and Bohemia in 1758. When the war ended in 1763, Frederick retained his conquests; Maria Theresa did not recover Silesia. In 1765 her son Joseph II succeeded his father as emperor, and was associated with his mother in the government of her dominions. Under pressure from Joseph and with great reluctance, she was accessory to the first partition of Poland in 1772. She died Nov. 29, 1780. Among her other children were the emperor Leopold II and Marie Antoinette, the queen of Louis XVI of France. A woman of great force of character, she fostered the re-



Maria Theresa
After the portrait
at Versailles by
J. M. Nattier

sources of her dominions, and greatly raised the prestige of the empire. See Austrian Succession, War of; Frederick the Great; Pragmatic Sanction; Seven Years' War; consult also Lives, J. F. Bright, 1910; M. Moffatt, 1911; M. Goldsmith, 1936; C. L. Morris, 1938.

Maria Theresa, ORDER OF. Austrian military order. It was instituted in 1757 by the empress



Maria Theresa.
Badge and ribbon
of the order

Maria Theresa, and consists of three classes, the third being added in 1765. The badge is a white cross with a gold edge, the ribbon is red and white, and the device is Fortitudo. It must not be confounded with the Austrian military order of Elizabeth Theresa, instituted in 1750 and remodelled by Maria Theresa in 1771, which has a black ribbon.

Maria Theresa Dollar. Coin current in parts of Africa and Arabia. Dated 1780 and about the size of British crowns, the coins are minted in London, and are in use in the colony of Aden, Abyssinia, parts of the republic of Sudan, and Arab territories bordering the Red Sea. On one side is the head of Maria Theresa, and on the other the arms of the Holy Roman Empire with the date. The coins have a silver content of 83½ p.c.

Mariazell. Town of Austria, in N. Styria. It is 56 m. S.W. of Vienna and is reached by a branch rly. from St. Polten. Thousands of pilgrims annually visit the wonder-working statue of the Virgin that stands on a silver altar in the 14th century chapel incorporated in the 17th century church. Iron is worked here and at Donauwitz.

Maribor (Ger. Marburg). Town of Yugoslavia. It stands on both banks of the Drave, in Slovenia, 55 m. N.N.W. of Zagreb. It has a 16th cent. cathedral with a lofty tower, a castle, and a town hall of the 17th cent. It is the seat of the bishop of Lavant, who has a palace here. The town has a trade in wine and agricultural produce; other industries are the manufacture of railway stock, boots and shoes, etc. There was a settlement here in Roman times. The town is now a summer resort. Pop. 33,131.

Marico. Tributary of the Limpopo river, South Africa. It rises in the W. Witwatersrand, and forms part of the boundary between Transvaal and Bechuanaland. The valley contains good irrigable land and is rich in lead and silver. Zeerust is the principal town.

Marie (1875-1938). Queen of Rumania. Daughter of the duke of Edinburgh and granddaughter of Queen Victoria,



Marie, Queen of
Rumania

she was born at Eastwell, Kent, Oct. 29, 1875, and christened Marie Alexandra Victoria. On Jan. 10, 1893, she was married at Sigmaringen to Ferdinand, crown prince of Rumania, who succeeded to the throne in 1914, though he was not crowned until 1922. The queen won admiration for her courage and assistance during the cholera epidemic of 1913. After the First Great War she worked tirelessly for the cause of Greater Rumania, finally established by the peace treaties. After King Ferdinand's death in 1927 she lived mainly in England and the U.S.A., devoting herself to charitable works and to writing, in which she had already enjoyed success. Her books in English include *My Country*, 1916; *Ilderim*, 1925; and her autobiography in three volumes, 1934-35. She died July 18, 1938. Among her children were ex-king Carol of Rumania; Elizabeth, who married George II of the Hellenes; and Marie, queen of Yugoslavia.

Marie Antoinette (1755-93). Queen of France. Daughter of the empress Maria Theresa and Francis I, she was



Marie Antoinette,
Queen of France
After Greuze

born in Vienna, Nov. 2, 1755. No pains were taken over her education, and she was barely 14 when she was betrothed to the dauphin, afterwards Louis XVI, marrying him May 16, 1770. Her rather boisterous humour and total disregard of etiquette immediately made her position at court difficult, and when her husband succeeded to the throne in 1774 the grossest libels were circulated about her. Receiving the ad-

dresses of Count Fersen and others, Marie Antoinette was soon an object of general hatred, and the affair of the Diamond Necklace (*q.v.*) only increased the odium in which she was held, and further besmirched her character.

Though the queen's worst fault was lack of understanding, she soon realized the weakness of her husband, and her influence was continually used against reform. The people attributed every national disaster to her, and when the financial situation of France grew desperate she was nicknamed *Madame Deficit*. When the Revolution came it was she rather than the king who was blamed for the misgovernment of centuries. Mirabeau could and would have saved her but she hated him and refused his aid. The abortive flight to Varennes only seemed to show more clearly that she was seeking foreign aid and inviting invasion. The Tuileries was invaded by the mob, June 20, 1792; Louis, wearing the cap of liberty, was treated with contempt, but upon Marie Antoinette the crowd heaped such hideous abuse that her hair turned white in the night.

On Aug. 10, the Tuileries was again stormed, her Swiss guards were killed at their posts, and the royal couple were sent as prisoners to the Temple. Marie Antoinette was separated from Louis in Dec., to see him again only on the morning of his execution, Jan. 21, 1793, and for ten months longer she lay in prison. Her son was taken from her in July. Two attempts were made to rescue her, and in Aug. she was moved to the Conciergerie. She appeared before the revolutionary tribunal on Oct. 14, and was accused of treason. She maintained her calm to the last, repudiating the unnameable charges Hébert levelled against her with a dignity which

impressed even her callous judges. The trial lasted two days, sentence of death was passed at 4.30 a.m. on Oct. 16, and at 11 she ascended the scaffold. *See* Conciergerie; Effigy illus.; French Revolution; Louis XVI.

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Marie de' Medici (1573-1642). Queen regent of France. A daughter of Francesco de' Medici, grand duke of Tuscany, she was born at Florence, April 26, 1573, and in 1600 married Henry IV of France. Henry was murdered in 1610 and Marie became



Marie de' Medici,
Queen of France
From a medal

regent to their son, Louis XIII. An ambitious and unscrupulous woman she was influenced by Concini and his wife, Italians whom she had brought with her from Florence. In 1617 Louis asserted his authority, was privy to the murder of Concini, and exiled his mother to Blois, where she remained until 1619. She was then liberated, but her attempts to regain power were futile. She made an enemy of her former counsellor Richelieu, and in 1631 fled the country, dying at Cologne, July 3, 1642.

Marie Galante. French island in the West Indies, a dependency of Guadeloupe. It yields sugar and tropical fruits, and has rocky shores and no good harbour. The chief town is Grand Bourg. Area, 60 sq. m. Pop. 14,927.

Marie Leszczynska (1703-68). Queen of France. She was the daughter of Stanislas Leszczynski, king of Poland, and was born at Breslau, June 23, 1703. At 22 she was married to Louis XV of France, then 15. Homely, practical, and affectionate, she endured much from the insolence of her husband's favourites, and led a semi-retired life, engrossed in works of charity and religion. She had two sons and eight daughters. She died at Versailles, June 24, 1768.

Marie Louise (1791-1847). Empress of the French. A daughter of Francis I of Austria, she was born Dec. 12, 1791. She was 18 when Napoleon divorced his wife Josephine and arranged a marriage with this Austrian princess. The wedding was celebrated by proxy at Vienna, March 11, 1810, the civil and religious rites proper being celebrated in Paris on April 2. A son, styled the king of Rome, was born in 1811. Marie Louise acted as regent during Napoleon's absence in 1814, but proved utterly incapable. When the allies were



Marie Louise

After Prudhon

approaching Paris, she left the city on the express instructions of Napoleon and joined his brothers at Blois. After his abdication she returned to Austria under the escort of the Count von Neipperg, refusing to reside with her husband at Elba. At the congress of Vienna the duchies of Parma, Guastalla, and Piacenza were settled upon her. In Parma she came under the influence of Neipperg, to whom she bore several children, and whom she married in 1822. After her departure from France she never beheld her son until he lay on his deathbed in 1832, and her whole aim seems to have been to forget her association with Napoleon. She died in Vienna, Dec. 18, 1847. The diaries of Marie Louise were edited by F. Masson, 1922. *See* Napoleon

Marienbad (Czech. Mariánské Lázně). German and more familiar name of a famous spa of Czechoslovakia. It lies in the old prov. of Bohemia, 19½ m. S.E. of Cheb (Eger), in a picturesque valley amid pine-clad hills. The ten springs are cold and contain



Marienbad. General view of the Czech spa, beautifully situated among pine-covered hills at a height of over 2,000 ft.

Glauber's salt. Besides drinking water there are provided chalybeate, saline, peat, and mud baths. There are English, Russian, and Protestant churches.

Marienberg. Town of E. Germany, 32 m. S.S.E. of Chemnitz, on the N. slopes of the Erzgebirge. S. Mary's church and the town hall both date from the 16th century. There are textile and toy factories. Pop. (est.) 10,000.

Marienburg (Pol. Malbork). Town of Danzig (Gdansk) region, Poland, formerly in E. Prussia. It is 28 m. S.E. of Danzig, on the right bank of the navigable Nogat, which during 1920-45 formed the frontier with Danzig free state. Marienburg is famous as the residence of the grand masters of the Teutonic Knights, whose castle here was severely damaged when the Russians took the town Jan. 26, 1945. This castle, covering with its annexes nearly 10 acres, was begun in 1276 and considered the greatest secular building of the Middle Ages; it was completed in 1398, taken by the Poles in 1457, and fell to Prussia in 1772. Between 1817 and 1914 all the buildings were repaired.

In the 20th century Marienburg was developed industrially, with chemical, soap, cigar, and furniture industries, and it is a railway junction. Its population of about 25,000, being German, was expelled when the Poles took over administration of S. East Prussia in 1945.

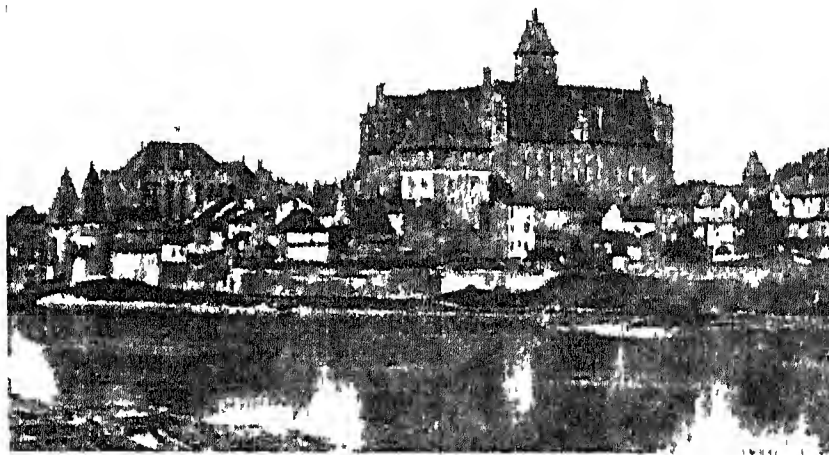
Marietta. City of Ohio, on the Ohio R., at the mouth of the Muskingum, 95 m. S.E. of Columbus. It is the co. seat of Washington co., the oldest settlement in the state, and the oldest town W. of the Alleghenies, founded in 1788 by a group of Revolutionary officers from New England. The name honoured Marie Antoinette. Civic rights date from 1852. Among memorials and landmarks are a sculptured group of six heroic figures by Borghum; the Campus Martius memorial museum; and the Mound cemetery, which includes an ancient Indian burial mound and the graves of 24 Revolutionary officers. In the library of Marietta College, which was founded in 1835, is a notable collection of Americana. The "elm city" has the largest elm in the U.S.A., shady streets, and houses in Colonial, Tudor, and Gothic styles. It is served by rly.,

steamer, and an airport. It is situated in a gas and oil field. Manufactures include castings, gas engines, safes, furniture, concrete, chemicals, paints. Pop. (1950) 16,006.

Mariette, FRANÇOIS AUGUSTE FERDINAND (1821-81). French Egyptologist. Born at Boulogne, Feb. 11, 1821, he graduated at Douai, 1841, became professor at Boulogne, studied Egyptology, and entered the Louvre, Paris, 1849. During an Egyptian visit he discovered the Serapeum in 1851; and the so-called temple of the Sphinx at Gizeh in 1853. He returned to Cairo in 1858 as first director of the Egyptian service of antiquities, and persuaded the Khedive to found the national museum of antiquities at Bulak, Cairo. He supervised excavations on 37 sites,



Mariette Pasha,
French Egyptologist



Marienburg, Poland. The castle of the Teutonic Knights as it was before the Second Great War

including Dendera, Edfu, Karnak, Abydos, and Tanis. He was made pasha, 1879, and died at Bulak, Jan. 19, 1881. Several of his books about his discoveries were translated into English.

Marigold (*Calendula officinalis*). Annual herb of the family Compositae, native of S. Europe. It has oblong leaves, and large orange-rayed flowers, which are produced plentifully from spring to autumn. This is the marigold of the poets, and was used for making marigold vinegar, a domestic remedy, and for flavouring soups. The marigolds of florists are native to Mexico, called African marigold (*Tagetes erecta*) and French marigold (*T. patula*). See Marsh Marigold.

Mariinsk. Town of Kemerovo region, R.S.F.S.R. It is 110 m. E. of Tomsk, on the Trans-Siberian rly. and the river Kiia. It is the supply point for the gold mines of the Kuznetz Ala-Tau

which lie to the S., and has tanneries, brickworks, and soap factories.

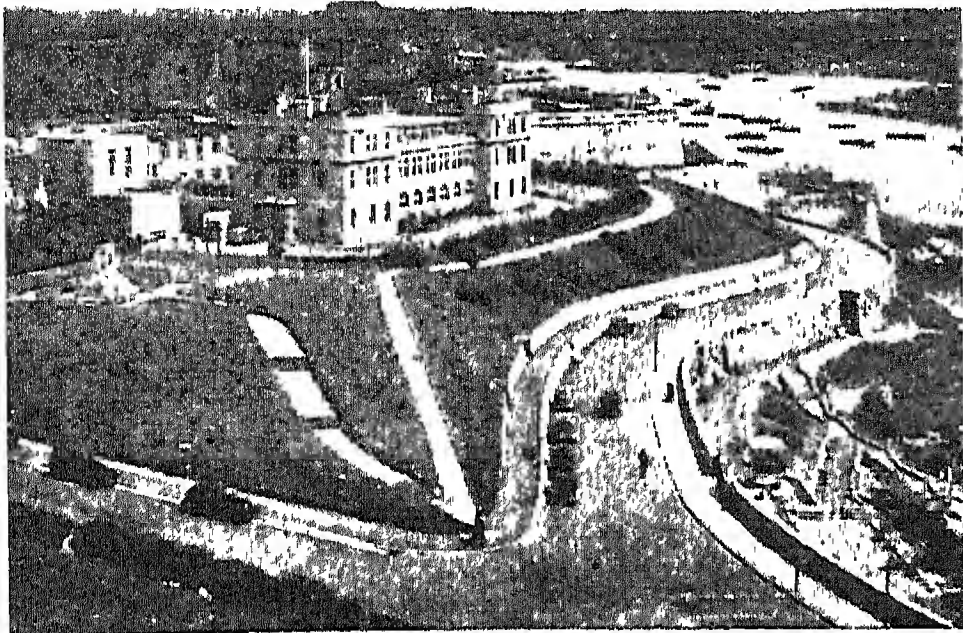
Mariinsk Canal System. System of navigable waterways linking Leningrad with Sheherbakov on the river Volga. It includes canalised parts of rivers linked by artificial channels and reservoirs and brings supplies to the industrial region of Leningrad.

Marijuana. American name for bhang (*q.v.*), a narcotic.

Marinduque. One of the Philippine Islands, formerly a separate prov. It lies S. of Luzon and covers an area of 352 sq. m. Its well wooded surface rises to 2,500 ft. in San Antonio and other peaks. Among the chief products are rice, hemp, coconuts, and copra. Tobacco has been cultivated with success since 1799, and the existence of petroleum is reported. Bone is the chief town.

Marine Biological Research. Investigations aimed at increasing knowledge of the animal and plant life of the seas. Up to the time of the celebrated voyage of H.M.S. Challenger, 1872-76, such investigations had been left to naturalists accompanying surveying vessels, or making individual investigations on a smaller scale. At about the time of the Challenger Expedition (*q.v.*) it became apparent to maritime powers that fisheries regulations were necessary; and the need for accurate knowledge of the biology of marine organisms of use to man, before regulations could be formulated, was recognized.

The advancement of marine biology has been helped principally by the organization of further long-range, deep-sea expeditions, the establishment of marine biological stations at suitable places along the coasts, and fisheries investigations. Of many expeditions from Scandinavia among the more notable have been those of the Michael Sars (Norwegian) and the Dana (Danish). The Tiefsee, Plankton, and Meteor expeditions from Germany were outstanding. Prince Albert I of Monaco fitted out and personally headed several smaller expeditions, besides founding his famous museum of oceanography. Important expeditions have also been made by Dutch scientists. As a result of voyages of ships of the British Discovery Investigations, with the primary object of studying conditions relevant to the Antarctic whaling industry, more is known about the life of the southern ocean than of any other large sea-area.



Marine Biological Research. Plymouth Laboratory of the Marine Biological Association of the United Kingdom

In the U.S.A., since the pioneering days of Louis and Alexander Agassiz and the fisheries steamer Albatross, several expeditions, including the voyages of the Atlantis, have been organized.

At M.B. stations students and research workers from the universities and other scientists can study marine organisms under good lab. conditions, with facilities for work on living material. The first great M.B. station was founded on an international basis at Naples by Anton Dohrn, in the same year (1872) that the Challenger sailed; most maritime countries now have several. In Great Britain the leading such station is the Plymouth lab. of the M.B. association of the U.K. The govt. fisheries lab. at Lowestoft was an early offshoot from Plymouth. Other important stations are at Port Erin, I. of Man, and at Millport, Gt. Cumbrae I., connected respectively with Liverpool and Glasgow universities. The small Gatty marine lab. at St. Andrews, recently reopened, was first in the field (1883). In the U.S.A. the most important stations are at Woods Hole and La Jolla.

Many universities, especially in the U.S.A., have oceanographical depts. where marine biology is studied. In the U.K., Liverpool and Hull have specialised in oceanography.

Marine biology concerns knowledge of the cycle of life in the sea as well as of the distribution, seasonal variations, and migrations of marine animals. Detailed morphological and biological work is also carried out on individual species. The life-histories, growth-rates, etc., of the fishes, and their environment, animate and inanimate, are studied, e.g. other

organisms inhabiting the same sea area in the light of their potentialities as food for the fish, or as enemies preying on the fish, and physical factors such as currents and temperature.

Practical applications of marine biology, other than those affecting fisheries, include methods of using seaweeds, and of dealing with

organisms which attach themselves to and foul ships' bottoms or damage under-water structures by boring.

The international council for the exploration of the sea, with H.Q. in Copenhagen, has fostered marine biology, and the science owes much to the cooperation of practical fishermen, whalers, and seamen generally. See Oceanography. Consult also The Depths of the Ocean, John Murray, J. Hjort, and others, 1912; Founders of Oceanography, W. Herdman, 1923; The Seas, F. S. Russell and C. M. Yonge, 1928; Science of the Sea, E. J. Allen, 3rd ed., 1928; The Oceans, Sverdrup, Johnson, and Fleming, 1942; The Fish Gate, M. Graham, 1943.

Marine Corps, U.S. Branch of the U.S. armed forces. Formed by the first Continental Congress in 1775 as a part of the naval establishment for duty at sea or on shore, it is the oldest force in the military or naval service

of the U.S. The corps furnishes detachments aboard battleships, cruisers, and aircraft carriers; maintains amphibious striking forces with the navy; and provides garrisons at naval shore stations. The organization includes infantry, artillery, paratroopers, armoured and supply units. There is also a Marine Corps air force. The strength in peacetime is 100,000; but during the Second Great War it was of the order of 500,000. The headquarters is at Washington, D.C. In both the First and Second Great Wars a Marine Corps women's reserve was formed; in the First for clerical duties only, and in the Second for administrative duties, to serve as ground crews of the air force, and to maintain vehicles and supply depots.

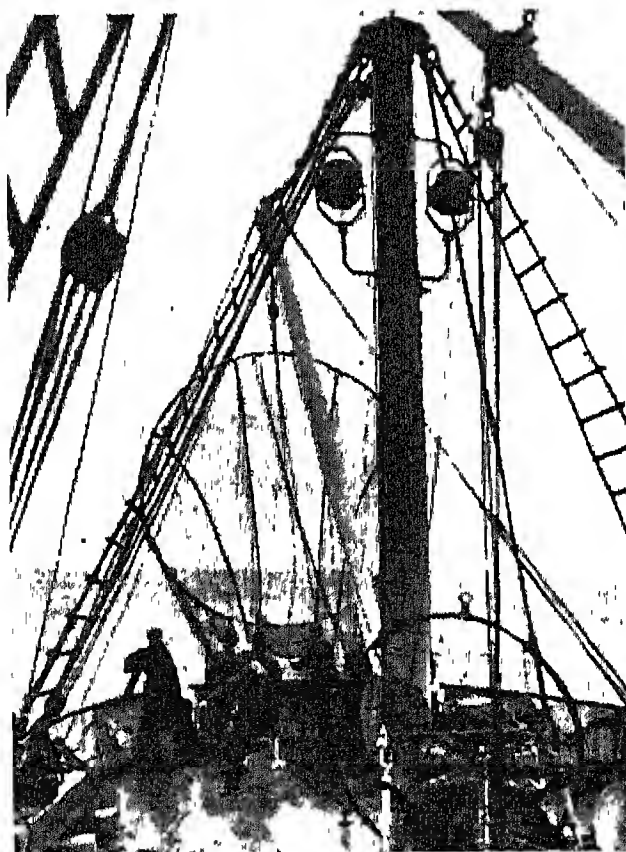
Considered a corps d'élite, units of the Corps especially distinguished themselves during the Second Great War in the defence of Wake Is., Dec., 1941; in the Philippines; in New Guinea; and in the capture or recapture of Guadalcanal, Guam, Saipan, Tarawa, Iwo Jima, and Okinawa.

Marine Placers. A type of mineral deposit formed by gravity concentration on sea-shores. When a rock forming a cliff or bluff is eroded by wave action, the heavy minerals tend to be concentrated in streaks and lenses on the beach—the concentration being effected by the movement of the water and differences in specific gravity between the light and heavy minerals. The beach at Nome, Alaska, was phenomenally rich in gold. See Placer Deposits.

Mariner's Compass. Type of navigating instrument used to indicate the direction in which a ship is moving. See Compass.

Marines. Name given in Great Britain to soldiers raised and trained for service on board ship. See Royal Marines.

Marine Sedimentation. Process by which solid materials are deposited on the sea floor. Marine sediments were first systematically investigated by Murray of the Challenger Expedition (q.v.), 1872–1876. Study of marine sedimentation involves research into, e.g., the origin of sediments, the way they are transported to the ocean floor, the formative chemical changes taking place, and the distribution and vertical stratification of the structures formed by the accumulation of this material. Many of the rocks at present above sea level are



Marine Biological Research. The 4½-metre plankton net being shot from R.R.S. Discovery II

sedimentary deposits laid down under former seas.

Some of this sedimentary material, *e.g.* quartz, mica, feldspar, is derived from the weathering of rocks and is carried by streams in solution into the sea. Volcanic activity also contributes lava fragments, pumice, volcanic glass, etc. Of particular importance and interest are the skeletal remains of planktonic organisms, the foraminifera and pteropoda giving rise to calcareous deposits and the diatoms and radiolaria to siliceous deposits. Fragments of benthic organisms such as corals also contribute appreciable quantities of calcareous material. Inorganic substances precipitated out of sea water, especially calcium carbonate and probably dolomite, can form part of the sedimentary covering; even meteorites have been dredged from the sea floor.

Marine sediments fall into two groups, pelagic and terrigenous. Pelagic deposits are found in the deep ocean basins and extend across 75 p.c. of the total area of the ocean floor. Inorganic pelagic sediments (defined as those containing less than 30 p.c. of organic material) are known as red clay, while the organic pelagic sediments (containing more than 30 p.c. of organic material) are called oozes, *e.g.* globigerina ooze, pteropod ooze, diatom ooze, radiolaria ooze. Red clay and globigerina ooze are the most widely distributed, but of particular note is the almost continuous belt of diatom ooze around Antarctica, whose seas support a rich growth of diatoms. Radiolarian ooze is typical of the equatorial regions of the Pacific ocean, while pteropod ooze occurs in substantial quantities only in the Atlantic.

Terrigenous deposits form a zone near the shores, usually containing at least some coarse material derived from the land. Here are sands, silts, and muds, usually classified according to the size of the constituent particles. The remains of planktonic organisms may form part of these deposits, but in addition the calcareous skeletons of organisms which live on the sea floor (benthos) are particularly abundant in terrigenous sediments of low latitudes, in contrast to those of high latitudes which are chiefly composed of mineral fragments.

Dredges and snappers are used to collect samples of bottom deposits. For investigation of the vertical layering, long metal tubes are driven into the sediments

either by their own momentum or by an explosive charge, and when pulled out contain a sedimentary core. Cores up to five yards long are thus secured; they yield much valuable data on the past history of the oceans.

N. B. Marshall

Marine Store Dealer. Person dealing in anchors, cables, sails, old junk, old iron, or other marine stores. He must have his name and the words "Dealer in Marine Stores" painted in letters 6 ins. long on every warehouse belonging to him. He must keep proper books showing when each article was bought and the name, address, and description of the person from whom he bought it. He must not buy from persons under 16.

Marinette. City of Wisconsin, U.S.A., the co. seat of Marinette co. It stands on Green Bay, an arm of Lake Michigan, at the mouth of the Menominee, 161 m. N. of Milwaukee, and is served by rlys. and lake steamers. Connected with Menominee and Michigan across the river by bridge and car ferry, it is a port of entry. A trading post in 1795, it became, by virtue of its good harbour, a fur trading and lumber shipping centre, specialising in white pine until 1900. This activity has declined, but Marinette has paper and pulp mills and granite works. Settled in 1830, it became a city in 1887. Pop. (1950) 14,178.

Marinetti, FILIPPO TOMMASO (1876-1944). Italian writer. Born at Alexandria, Dec. 22, 1876, he was educated at the Sorbonne, and was awarded a prize for his poem, *Les Vieux Marins*. Initiator of the futurist movement in arts and politics, he issued his first manifesto in 1909, writing and lecturing extensively and advocating principles which were to reach their logical development under fascism. After the First Great War he founded the *Fasci Politici Futuristi* in an attempt to associate his ideas more closely with those of Mussolini. Apostle of the doctrine that war brings out a nation's highest qualities, he fought in the Abyssinian campaign of 1935-36, and died Dec. 2, 1944. His chief works include *La Conquête des Étoiles*, 1902; *Futurismo e Fascismo*, 1922.

Marini, GIAMBATTISTA (1569-1625). Italian poet. He was born at Naples, Oct. 18, 1569, and lived successively at the courts of Rome and Turin before passing on to the patronage of Marie de Medici at Paris. Here he wrote his most

famous work, *Adone*, 1623, an epical romance on the loves of Venus and Adonis. His verse, sonnets, eclogues, canzoni, etc., all



G. Marini,
Italian poet

opulent and sensuous, and sparkling with conceits, gave rise to something of a new school of poetry, and long enjoyed wide popularity.

Marini died at Naples, March 25, 1625.

Marino. Town of Italy, in the prov. of Rome. Picturesquely placed at an alt. of about 1,200 ft. on the Alban Hills, it is 15 m. by rly. S.E. of Rome. It was the stronghold of the Orsini from 1266 to about 1420, when it passed to the Colonnas. The town is noted for its wine. Pop. (1951) 19,411.

Mariolatry. Popular but incorrect name applied to the veneration or worship of the Blessed Virgin Mary, as practised by the R.C. Church. The term is incorrect, inasmuch as the supreme worship (*latreia*) has never been accorded to the B.V.M., but is restricted to God alone. R.C. theologians ascribe to her only the highest veneration (*hyperdulia*), while a lesser reverence (*dulia*) is paid to the saints generally. In the liturgical prayers of the missal and breviary are to be found only petitions that the faithful may be aided by her intercession with God. But the popular devotions go much farther, as is shown by such expressions as Gate of Heaven, Co-Redemptrix, our only Hope of Salvation.

Anything like direct invocation of the B.V.M. was unknown in the first centuries of the Christian Church, but in the 4th century the Collyridian heretics were charged with worshipping her. The oldest form of devotion to the B.V.M. is the Hail Mary, the first half of which—taken from the angel's salutation in the Gospel—was first used in the 7th century. The second half of it, which alone contains a direct prayer, is not known to have been used till the 15th century. In the 12th century the Crown of the Virgin, which consisted of 63 recitations of the Hail Mary (first half), came into use; while the Rosary (*q.v.*) dates from the 13th century, being commonly said to have been devised by S. Dominic in 1210. The practice of saying the Angelus—consisting of three Hail

Marys, a collect, and some versicles—morning, noon, and night, at the sound of the church bell, dates from the 14th century. At the Reformation, the invocation of the B.V.M. was abandoned by Protestants as unwarranted by Holy Scripture. See Angelus; Ave Maria; Mary; Rosary.

Marion. City of Indiana, U.S.A., the co. seat of Grant co. It stands on the Mississinewa, 70 m. N.E. of Indianapolis, and is served by rlys. and an airport. It was known as "queen city of the gas belt" when natural gas and then oil were discovered in the 1880s and '90s, but supplies of both were soon exhausted and the city turned to other industries, e.g. manufacture of glass, insulated wires and cables, electric stoves and lanterns, footwear, food products, flour, and paper. Settled about 1825, it became a city in 1889. Pop. (1950) 30,081.

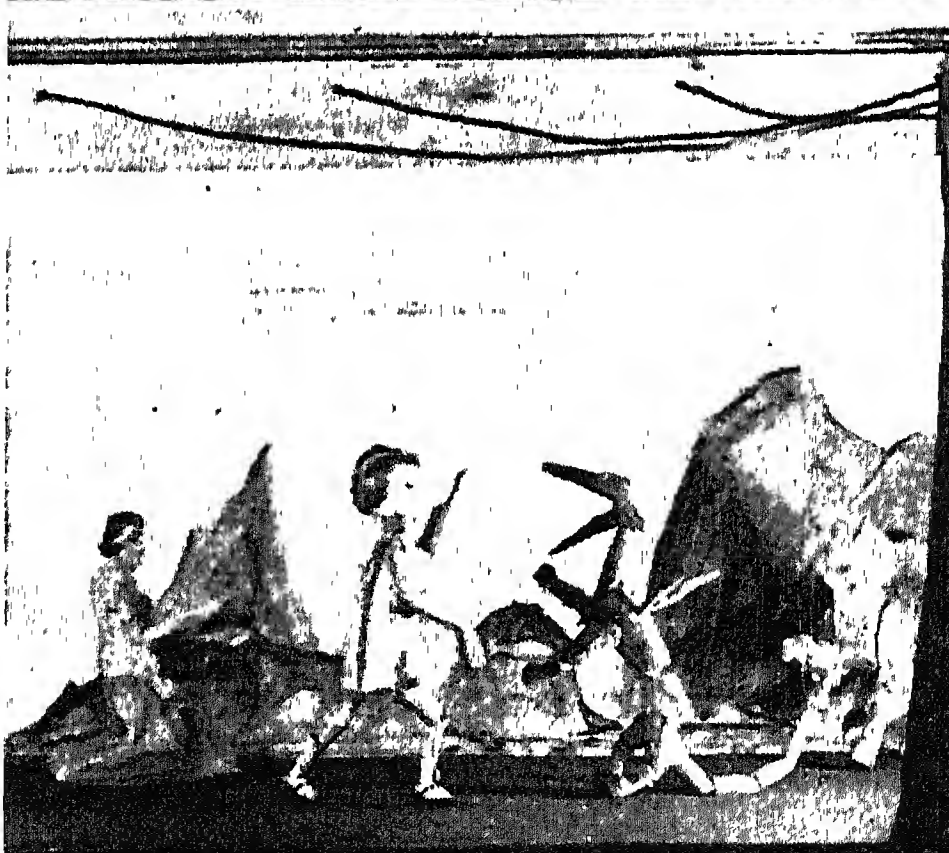
Marion. County seat of Marion co., Ohio, U.S.A. The city is 45 m. N.W. of Columbus, and is served by rlys. and an airport. Centre of a farming district, it has limestone quarries, rly. yards and shops, and turns out steam, gas, electric and Diesel shovels, dredges and conveying equipment, tractors, and agricultural machinery. Founded in 1821, it became a city in 1880. President Harding (q.v.) was associated with Marion from 1884 until his death in 1923, publishing *The Marion Star* before he entered politics; he is buried here, and his memorial is a mile to the S. Pop. (1950) 33,817.

Marion. One of two islands in the Indian Ocean, the other, 12 m. N.E., being called Prince Edward Island. Situated in lat. $46^{\circ} 27' S.$, and long. $37^{\circ} E.$, it is 1,200 m. S.E. off the coast of S. Africa. Marion is 12 m. long and 7 m. wide. It consists of a narrow shelf sloping steeply upwards to a snow-covered mountain 4,200 ft. high. The island is bleak and desolate, its level parts boggy and covered in lichen. Marion was discovered in 1772 by the French explorer Marion du Fresne, who erroneously believed it to be part of the Antarctic continent. It was visited in 1776 by Cook on his way from the Cape to Tasmania and New Zealand, and was claimed for the British crown. The island remained uninhabited until 1947, when it was officially occupied by the Union of S. Africa on Dec. 30. A weather forecasting station was set up; and the island became strategically important as a base for air patrols over the Indian Ocean.

Marionette. One of the many types of dramatic figure included in the general term puppets. Marionettes are full length figures, in contrast to the bodiless sleeve or glove puppets of the Punch and Judy type. They are made of wood, metal, or plastic material, and are articulated in various ways so that they can perform the special movements required by their manipulator. They are controlled from above the stage on which they act by means of wires or strings, whereas glove and rod puppets are operated from below the stage level.

The origin of the name marionette is obscure, but marionettes are certainly of great antiquity. It is probably a diminutive of Mary, since small images of the Virgin, jointed and manipulated

like the present-day marionette, were known in the 16th century. There are records of marionette performances in ancient Greece as early as 420 B.C. China, Japan, India, Burma, and Java each has its traditional dramas. France, Germany, Italy, Sicily, Belgium,



Marionette. Boys of Beckenham and Penge County School rehearsing their puppet under-water ballet. Top, marionette show at the Grafton Theatre, London. from the operator's view-point

and Russia have long been homes of the marionette. Each country has its own distinctive types and its own traditional plays and sets of characters, with their own peculiarities of dress and methods of manipulation.

In England marionettes were known in early times as motions. Shakespeare makes mention of them in several of his plays, and Ben Jonson in his *Bartholomew Fair* lays a riotous scene in a puppet booth. Cervantes in *Don Quixote* gives an almost similar scene in a marionette theatre. They were very popular also in

the 18th century. Powell, one of the most famous of English showmen, established his puppet theatre in the vicinity of S. Paul's, Covent Garden. There were also a number of famous English troupes in the 19th century. See Puppet; consult also *Histoire des Marionnettes*, C. Magnin; *A Book of Marionettes*, H. H. Joseph, 1920; *Everybody's Marionette Book*, Whanslaw, 1935.

Mariotte, EDMÉ (c.1620–84). French physicist. Born in Burgundy, he became one of the original members of the Academy of Sciences in 1666. He carried out experiments to determine the height of the barometer, the motion of water through pipes, and other problems in hydraulics, and the composition of air, on which he published a book containing a statement of Boyle's law, which Mariotte discovered independently, and which is known in France as Mariotte's law. He died in Paris, May 12, 1684. See Boyle; Gas.

Mariposa Grove. Tract of land in Mariposa co., California, U.S.A. About 4 sq. m. in extent, it contains two groves of the *Sequoia gigantea*, or redwood, the largest tree having a circumference of 94 ft., and its main trunk a height of 200 ft. The road through the grove passes through an opening 9½ ft. wide, piercing the base of one of the trees. The tallest is 272 ft. high. The area is reserved as a national park. Mariposa is Spanish for butterfly.

Maris, JACOB (1837–99). Dutch painter. Born at The Hague, he studied first at The Hague Academy, and afterwards in Antwerp and in Paris under Hébert. At Paris he came under the influence of the Barbizon school (*q.v.*), and exhibited at the Salon, 1862–72. Returning to The Hague, he painted Dutch landscape, river scenes, and coast scenery, and



Jacob Maris,
Dutch painter



Marionette. Reproductions from a Japanese print illustrating a head with the mechanism for moving eyes and mouth; arms and hands, with contrivance for working the fan; complete figure with movable head and limbs
By courtesy of The Marionette, Florence

died at Karlsbad, Aug. 17, 1899. His work is remarkable for its delicate rendering of atmospheric effects and its strong sense of design. The Drawbridge is in the National Gallery, London.

Maris, MATTHEW (1839–1917). A Dutch painter. Born at The Hague, he studied at the local art school, and later under Van Hove at Antwerp and Hébert at Paris. He developed a style and vision of his own, mystic, emotional, and irresistibly attractive. *Montmartre*, in the National Gallery, London, and *The Spinner* may be cited among his works. Several years he lived as a recluse in London, where he died Aug. 22, 1917.

Maris, WILLEM (1844–1910). A Dutch painter. Born at The Hague, he studied mainly under his elder brothers, Jacob and Matthew Maris. He is represented in the National Gallery, London, by a picture of Ducks, but most of his paintings are pastoral



Willem Maris,
Dutch painter

landscapes, executed with the freshness and vigour of the Dutch open-air school of the 19th century. He died in London in 1910.

Marischal, EARL. In Scotland, a high officer of state with duties similar to those of the earl marshal in England. Sir Robert Keith (d. 1346) was described as marischal to John Baliol in 1294, and about 1309 received a charter of the office of marischal of Scotland. The post became hereditary in the family of Keith, which in 1458 was raised to the peerage with the title of earl marischal. The office itself ceased to exist after the attainder in 1716 of George Keith, the 10th earl. See Earl Marshal.

Marischal, GEORGE KEITH, 10TH EARL (c. 1693–1778). Scottish soldier and politician. He succeeded his father in 1712, served under Marlborough, and on the death of Queen Anne was with difficulty restrained from proclaiming a military revolution in favour of the Pretender. He was dismissed, or retired, and, returning to Scotland, engaged in a Jacobite conspiracy, and fought at Sheriffmuir in 1715. He sheltered Prince James Edward in his house at Fetteresso, and after the rebellion escaped to the Continent, whereupon he was attainted and his estates forfeited. In 1719 he headed an abortive Spanish attempt to invade Scotland, and was defeated at Glenshiel. He made his way to the Hebrides, where he continued to intrigue against the government, but took no part in the rebellion of 1745.

Settling in Prussia with his brother, Marshal Keith he gained the friendship of Frederick the Great, who appointed him his ambassador in Paris. In 1759 he was pardoned by George II and returned to Scotland, but at the urgent request of Frederick returned to Prussia, where he became intimate with Voltaire, Rousseau, and other celebrities. He died May 28, 1778.



George Keith,
10th Earl Marischal
After P. Costanzi

Marischal College. One of the two colleges forming Aberdeen university. It was founded in 1593 by George Keith, 5th earl marischal, and, with the exception of a brief union with King's College in 1641, existed as an independent university until 1860, when it was united with King's College to form the present university of Aberdeen. The original college was rebuilt, greatly enlarged and improved in 1837–41.

and a still more important enlargement was carried out, 1895-1906, the new building being inaugurated by Edward VII in 1906, on the occasion of the celebration of the quatercentenary of King's College. Of the earl marischal's original building hardly a fragment remains except the famous stone preserved in the vestibule, inscribed "They haif said; quhat say thay; lat thame say." The college, in Broad Street, occupies the site of the grounds and conventual buildings of the Grey Friars or Franciscan Monastery. See Aberdeen; Aberdeen University.

Marissa. Ancient city of S. Palestine, the modern Merash. It is near Tell Sandahannah, 15 m. N.E. of Lâchish. The Biblical Mareshah (Josh. 15), its capture by Ptolemy I, 312 B.C., made it for three centuries a Hellenistic city, until finally destroyed by the Parthians. Apollophanes and other princes adorned their cave-tombs with unique painted friezes of animals and flowers. Macalister's excavations, 1900, yielded house-foundations and other archaeological remains.

Marists (from the name Mary). Roman Catholic congregation of priests and laymen devoted to parochial missions and retreats, and to educational and missionary work. The Congregation of Marist Fathers was founded at Belley, France, in 1816, and the Brothers were organized the following year.

The Marist Sisters received the formal approval of the pope in 1834. They undertake the care of the sick in hospitals and infirmaries, and conduct schools and orphanages.

Maritain, JACQUES (b. 1882). A French philosopher. Born Nov. 18, 1882, he was educated at Paris university, lectured at Toronto and Chicago universities, and was appointed to the chair of philosophy at the Institut Catholique, Paris. During the Second Great War he was visiting professor of philosophy at Columbia and Princeton 1940-44. French ambassador to the Holy See, 1945-48, he was appointed professor of philosophy at Princeton 1948.

A leading exponent of the philosophical school of R.C. mystics, he occupied a high place in contemporary French literature. Of his many works, the best-known included *La Philosophie Bergsonienne*, 1914; *Art et Scolastique*, 1920; *Réflexions sur l'Intelligence*, 1923; *Religion et Culture*, 1931; *Les Degrés du*

Savoir, 1932; *Questions du Conscience*, 1938. *True Humanism*, 1938, was written in collaboration with Raïssa Maritain, herself the author of several volumes which were translated into English, e.g. *De la vie d'Oraison*, 1925; *Le Prince de ce Monde*, 1932; *L'Ange de l'École*, 1934.

Maritime Alps. Portion of the Western Alpine system extending N.W. from the Ligurian to the Cottian Alps. They lie on the borders of France and Italy, and include the passes of Col di Tenda and the Col della Maddalena, besides several other carriage roads. Their spurs reach the shores of the Mediterranean. The chief peaks are Cima dei Gelas (10,127 ft.) and Mont Monnier (9,245 ft.). For the French department of this name, see *Alpes-Maritimes*.

Maritime Museum, NATIONAL. Public institution at Greenwich. Opened in April, 1937, it occupies the Queen's House (designed by Inigo Jones for Anne of Denmark, wife of James I, completed under Charles I) and the original Greenwich Observatory buildings (from 1953). It contains paintings of naval interest by Van der Velde, Gainsborough, Reynolds, Romney, Kneller, Lely, Hogarth and other artists; models of famous British ships; and the personal relics of famous seamen. Other important exhibits are a Mercator globe, made 30 years before the geographer showed the world on a flat plane; and the "Silver Map of the World," a medallion illustrating Drake's voyage round the world. From 1821 to 1933 the Queen's House was occupied by the Royal Naval School.

Maritime Provinces. Name given to the three E. provinces of the dominion of Canada: Nova Scotia (*q.v.*), New Brunswick (*q.v.*), and Prince Edward Island (*q.v.*).

Maritime Regiment. Former unit of the British army, raised to operate A.A. defences of merchant shipping during the Second Great War. The first gun crews were trained in 1940, and the regiment established in 1941. Soon there were four regiments, officially part of the Royal Artillery, about 12,000 strong, mostly volunteers from the army. They wore an Admiralty badge, a red anchor with the letters A.A., but were paid by the army. At first they operated in home waters, but later went all over the world, and were disbanded in 1945. Maritime regiments of the 17th century were the forerunners of the Royal Marines (*q.v.*).

Maritsa (Gr. Evros). River of the Balkans, the ancient Hebrus. It rises in the Rhodope mts., in Bulgaria, flows E. past Philippopolis (Plovdiv), then S.E. to Adrianople (Edirne), where it receives its chief tributary, the Tunja (*q.v.*). Turning S., it forms the boundary between Greece and Turkey, to fall into the Aegean near Enos. It is 300 m. long, and is navigable for small boats to Adrianople.

Mariupol OR ZHDANOV. Seaport of Ukraine S.S.R., in the Stalino region, on the N. shore of the Sea of Azov, 65 m. W. by S. of Taganrog in the R.S.F.S.R. It is a rly. terminus. Iron and steel works are the chief manufacturing of the city, which developed enormously before the Second Great War to support an est. pop. of 222,000. On October 14, 1941, Russian troops had to evacuate Mariupol after fierce fighting. It remained in German hands until recaptured, Sept. 10, 1943, after ten hours' bitter street fighting. It was later renamed Zhdanov, in honour of A. A. Zhdanov (*q.v.*).

Marius, GAIUS (157-86 B.C.). Roman general and statesman. Born at Cereatae, near Arpinum,



Gaius Marius,
Roman general
From a bust

of humble parents, he achieved the unique distinction of being elected consul seven times. His first military service was as a private soldier, and he showed conspicuous

bravery under Scipio Africanus in Spain, but not until 119 B.C. was he elected tribune, identifying himself with the popular party.

His next military service was against Jugurtha in Africa, as legate of the consul Metellus. Coming home while the campaign was in progress, he was elected consul, and returned to Africa in chief command, finishing the war with the capture of Jugurtha in 106. Meanwhile, grave danger menaced Rome from the N., vast hordes of Cimbri and Teutones having defeated the Roman armies sent to oppose their threatened invasion. All eyes turned to Marius as the one man who could save the city, and from 104 to 101 he was elected consul each year. The Teutones were completely defeated near Aquae Sextiae, and the Cimbri near Vercellae.

To further his political interests and obtain his sixth consulship,

Marius found it convenient to ally himself with two demagogues, Saturninus and Glaucia, but when they had proceeded too far with their revolutionary designs, he was forced into a position of hostility to them, and had to crush the insurrection they had provoked. The next 10 years proved comparatively quiet, but in the Social War (90–88) Marius rendered further services to the state. When war broke out with Mithradates, he was desirous of obtaining the chief command, but was passed over in favour of the patrician Sulla, who had a military force behind him. Marius was obliged to flee, and after several hair-breadth escapes he reached Africa.

Cinna had taken advantage of the departure of Sulla for the East to take up arms against the senatorial party, and Marius returned to Italy. Cutting off the food supply from Rome, Marius and Cinna entered the city, and the former was elected consul again. Their triumph, however, was stained by a terrible massacre of their opponents. Marius was to enjoy his consulship only for 18 days, dying Jan. 13, 86. Though scarcely a general of genius, Marius proved a most skilful leader. He was also a great army reformer, converting the old militia into a professional army, and introducing changes in equipment and organization. See Sulla; consult The Gracchi, Marius and Sulla, A. H. Beesly, 4th ed. 1884.

Mariut, MAREOTIS, MARYÛT, OR MARELA. Lagoon in Egypt, separated from the Mediterranean by a narrow tongue of land on which Alexandria is built. It was navigable during the Middle Ages, but subsequently almost dried up. In 1801 the British cut the sand dunes at Aboukir, and the area was flooded.

Marivaux, PIERRE CARLET DE CHAMBLAIN DE (1688–1763). French author. Born in Paris, Feb. 4, 1688, he had little education, but showed literary capacity as a boy. His comedies, e.g. *Le Jeu de L'Amour et du Hazard*, 1730, are marked by a great deve-



Pierre de Marivaux,
French author

lopment of emotional interest, and by an over-refinement of thought and style which came to be called "marivaudage." His novels, *Marianne*, 1731–42, and the unfinished *Le Paysan Parvenu*, give him a place in French fiction roughly analogous to that of Richardson in English. He died Feb. 12, 1763. Consult *Complete Works*, 12 vols., 1781; *Marivaudage*, A. Tilley, 1930.

Marjoram (*Origanum*). Genus of perennial plants of the family Labiatae. Several species are used as sweet and pot herbs. One is native to Great Britain, another was introduced from Crete in 1551. The shoots and stems of the sweet or knotted marjoram are gathered and dried, and used for flavouring purposes in cookery. *O. dictamnus*, otherwise known as dittany of Crete, is a rather tender species grown under glass.



Marjoram. Flower-head
of *Origanum vulgare*

armed forces. When a weapon or article of equipment is first brought into general use, it receives a serial number and the designation of Mark I. Modified types are allotted serial numbers and the designation Mark II, III, etc. The Lee-Enfield rifle, used by the British army before the No. IV was introduced, was Mark IV; tanks of the First Great War were Marks I, II, III, and IV; and aircraft were allotted mark numbers. German tanks were differentiated by marks.

Mark. Unit of German currency. Originally it was a silver bar of approximately $\frac{1}{2}$ lb. weight that was marked, i.e. assayed. Current in Germany since the 9th century, its name was given in 1871 to the new basic coin of the German empire, about the equivalent of the British shilling, subdivided into 100 pfennigs and minted in gold coins of 20, 10, and 5 marks, and smaller silver coins. The gold pieces were withdrawn during the First Great War. After the inflation of 1923–24, the depreciated currency was replaced by the Rentenmark, later (1924) Reichsmark, replaced 1948 by the Deutschmark (D.M.). The official rate of exchange of the D.M. was 12.35 to the £. On Sept. 29, 1949, following devaluation of the £ in terms of the \$, the value of the D.M. was fixed at 11.76 to the £.

Mark (Lat. *Marcus*). Jewish convert to Christianity in the Apostolic age and writer of the second Gospel.



S. Mark,
the evangelist
From a statue by
Donatello

If, as is probable, all the N.T. references allude to the same man, he bore the Hebrew name of John, was apparently a Levite of Cyprus, cousin to Barnabas, and son of a certain Mary who was prominent in the early Church at Jerusalem. He attended on S. Paul and S. Barnabas on their first missionary journey, but turned back at Perga, to the

displeasure of S. Paul, who, however, mentions him with affection in his epistles. Afterwards associated at Rome with S. Peter, who calls him his son, he is said to have acted as his interpreter, and to have received from him the facts embodied in the Gospel which bears his name. He is said to have died in Egypt. His festival is April 25, and his symbol is a winged lion.

Mark, THE GOSPEL OF. Earliest of the three synoptic gospels and the main source of the other two. The tradition that it was written by Mark goes back to very early times. Papias (c. 135) says, "Mark having become the interpreter of Peter wrote down accurately—but not, however, in chronological order—all that he remembered of the things which were said or done by Christ," and there is no reason to doubt the substantial truth of this assertion.

Mark is much shorter than the other two synoptists and omits much of the teaching of Jesus. It lays the emphasis on the works rather than on the preaching of Jesus. Hence many of the miracles are related at greater length and with more vivid detail than in the other Gospels. "In substance and style and treatment," says Westcott, "the Gospel of Mark is essentially a transcript from life. The course and issue of the facts are imaged in it with the clearest outline." It is generally held, on the strength of the testimony of Clement of Alexandria and Eusebius, that the Gospel was written at Rome. This hypothesis is supported by the presence of some

Latin words and idioms in the text. The date at which Mark was written cannot be determined with absolute accuracy. It is generally placed in the period 64-70, but it may have been composed about a decade earlier. Many modern scholars hold that the present Gospel was preceded by an earlier and briefer edition, and that the last 12 verses replace the original ending, now lost. *See* Gospels, The Four.

Mark Antony. The Roman soldier and statesman often known by this name is noticed as an historical person under Antonius, Marcus. As the hero of Shakespeare's tragedy Antony and Cleopatra, he will be found under that head. In Julius Caesar, however, he is called Mark Antony, and has the chief oratorical part in the play, delivering over Caesar's dead body the famous speech which opens, "Friends, Romans, countrymen, lend me your ears."

Markesh, HESHVAN OR HESVAN. Eighth month of the Jewish sacred year, and second month of the Jewish civil year. *See* Calendar.

Market (Lat. *mercatus*, trade). Place where goods are sold. In the Middle Ages the right to hold a market was one of the most valuable privileges that a king or lord could grant to a body of his subjects. Not only in England, but elsewhere in Europe, the growing towns secured by charter this right, which was jealously guarded, for the holding of a market was a source of considerable wealth to a town, while the king or lord received an income therefrom. In time every town of importance had its market, held on certain days and under certain conditions; hence the common phrase market town. Medieval markets were held in an open square in the centre of the town, therefore called the market place, and the chief buildings were put up around it. There on stated days vendors brought their wares and purchasers flocked to buy, a scene associated today rather with the word fair. The 11th century and onwards was perhaps the great age of the market, but in a sense it is almost as old as the human race, and ancient literature contains many references to markets.

Markets are still held, in the main on the days and in the places fixed in the past. They form an important source of revenue, sometimes to individuals, but more usually to municipalities, and large sums have been paid for them, as when the corporation of Manchester purchased the market rights from

the family of Mosley. In London there are a number of markets, certain classes of goods having their own, *e.g.* Covent Garden for fruit, and Billingsgate for fish, and the same principle prevails in other large cities. Most markets in Great Britain are now controlled by the municipalities, the power to establish them or buy them having been conferred on town councils and other bodies by an Act of 1875.

A more modern use of the word is for the whole of the transactions in a certain class of goods, *e.g.* the wool market, or the cotton market, refers to all dealings in those commodities, whether in London, New York, or elsewhere, and implies that there is only one price for the same article. Likewise the phrase money market covers all transactions in instruments of credit. Bankers, discount houses, and financial houses are said to form the money market. *See* Billingsgate; Covent Garden; Credit; Fair; Leadenhall Market.

Market Bosworth. Market town of Leicestershire, England. It is 12 m. W. of Leicester and has a rly. station. The church of S. Peter is a Perpendicular building, and there is a grammar school, at which Dr. Johnson was an usher. In 1920 a sanatorium for the National Society of Operative Printers was erected near Wellsborough. Bosworth Field, 2 m. S., was the scene of the battle in which Richard III was killed, thus ending the Wars of the Roses. 1485. Pop. 1,100. *See* Bosworth, Battle of.

Market Cross. Stone structure surmounted by a cross, standing in a market place. It was originally a plain cross-shaft upon a stepped pedestal, used for sermons and proclamations, as at Taunton and Royat in Puy-de-Dôme, shelter for wayfarers being afterwards provided by a roofed edifice with a central finial. Sometimes a tiled gable-roof upon four plain pillars, as at Castle Combe, it developed into a polygonal structure with arched openings, groined vaulting, niched statuary, and other enrichments. Many cruciform finials were destroyed during the Commonwealth. Typical examples are at Salisbury, Chichester, Shepton Mallet, Malmesbury, Winchester, Cheddar, Leighton Buzzard, and North Walsham. The Edinburgh cross, removed in 1617, was replaced by another, whereof only the shaft remains. *See* Cross illus.

Market Deeping. A town of Lincolnshire, England. It stands on the Welland, 8 m. N.W. of Peterborough. The nearest station

is at Deeping St. James, 3 m. E. In the fen country, it is surrounded by reclaimed land under good cultivation. S. Guthlac's church is an old foundation. Pop. 876.

Market Drayton OR DRAYTON-ON-HALES. Urban dist. and market town of Shropshire, England. It stands on the Tern, 18 m. N.E. of Shrewsbury, and is a rly. junction. S. Mary's church dates in part from the 12th century, and at the 16th century grammar school Robert Clive was educated. The town is an agricultural centre; ironfounding is another industry. It is thought to have been a British settlement. Near is Blore Heath, scene of a battle of 1459. Market day, Wed. Pop. (1951) 5,638.

Market Gardening. Production of flowers, vegetables, and salads for commercial purposes, including their grading, packing, distribution, and marketing. Consideration of soil, aspect, and district is vital before establishing a market garden. The ideal soil is one which is easily worked and well drained, and has been enriched with sufficient organic matter. A market garden should be on land in good heart, and the subsoil as well as the surface should be regularly cultivated.

Mechanisation is increasing in market gardening, as in other forms of working of the land. Ploughing, disking, hoeing are often done by tractor, planting by machinery, watering by mechanical means, the produce is washed by an electrical washer, the soil is heated by electricity, etc.

A relatively small area of the surface of Great Britain is devoted to market gardening, yet the total sales of horticultural produce per annum exceed those from agriculture. Compared, however, with the market gardeners of some of the countries of the Continent, many of those in Great Britain do not pay sufficient heed to washing, cleaning, grading, and packing. A national advisory service of the ministry of Agriculture exists to assist the market gardener to improve both his crops and his methods of picking, packing, and grading. In some Continental countries, *e.g.* Belgium and the Netherlands, market gardeners have developed a high degree of cooperation in the production of clean, well grown, well packed produce which has given them great advantages in international, as well as their own, markets.

Presentation is very important, and the best market gardeners everywhere grade and pack their

produce perfectly. They also have their own coloured labels, or brands, or makes, so that their goods come to be asked for by name. Cooperative packing stations market goods under the brand-mark of the company.

A market garden is an agricultural holding for the purpose of the Agricultural Holdings Act if it is cultivated wholly or mainly for the purpose of the trade or business of market gardening. Further the tenant has in general the rights of the tenant of such a holding (see Agricultural Holdings). If it has been agreed in writing after Jan. 1, 1896, that the holding shall be let or treated as a market garden a tenant may obtain compensation for certain improvements to the holding and has at the end of his tenancy the same right to remove fixtures (if erected after Dec. 31, 1900) as a tenant of any other agricultural holding. He may also remove all fruit trees and bushes not permanently set out. The improvements referred to are: planting of fruit trees or fruit bushes, permanently set out; of strawberry plants, or asparagus, rhubarb, or other vegetable crops which continue productive for two or more years; and erection or enlargement of buildings. When a landlord will not agree that the holding shall be treated as a market garden, the local agricultural committee may direct that the tenant shall nevertheless be entitled

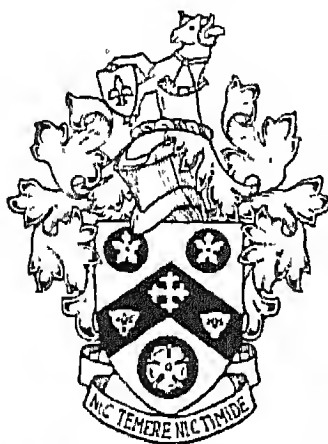
to compensation for such improvements. Market gardens, like other agricultural land, are exempt from the general rate.

A person who disposes only of surplus produce from his kitchen garden cannot class his holding as a market garden.

In Great Britain one customary method of marketing produce is to consign the goods to a commission salesman in a town or city market, who lends containers at an agreed charge. But before the Second Great War the best growers marketed most of their produce in non-returnable containers, which gave them complete freedom as to choice of the salesman and market for their goods. Sales can be made (a) direct to local customers; (b) by van deliveries in a nearby town; (c) to local shops, hotels, or res-

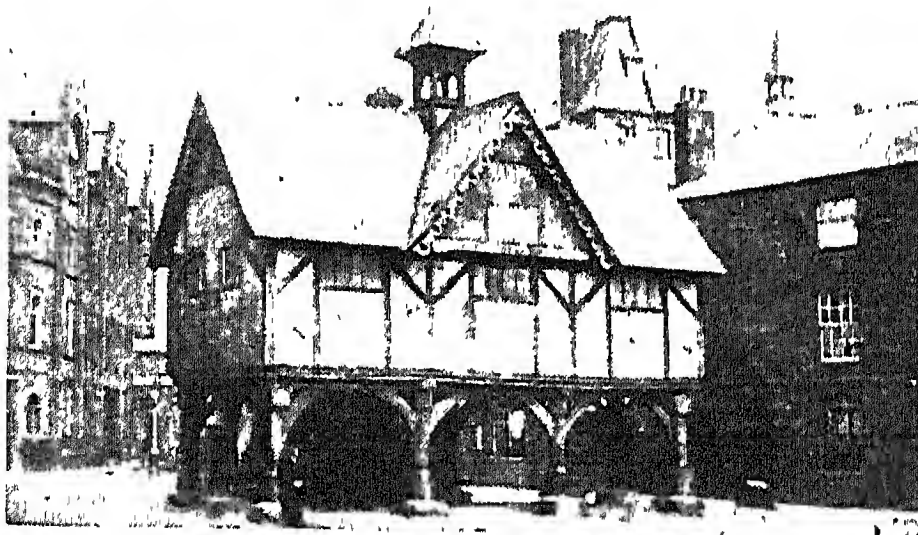
taurants, and (d) to a town or county wholesaler, who does not sell on commission, but gives a definite price. See Allotment; Kitchen Garden, etc., and under the names of various vegetable crops.

Market Harborough. Market town and urban dist. of Leicestershire. It stands on the Welland,



Market Harborough arms

15 m. S.E. of Leicester. It is served by rly. and canal, and is dominated by the church of S. Dionysius, a medieval building with an exceptionally fine broach spire. Near by is the early 17th-century former grammar school raised on stilts over the old market place. An agricultural centre with a large cattle market and variety of light industries including light engineering and the making of corsets, ladies' underwear, patent foods, shoe components, batteries, and



Market Harborough, Leicestershire. Former market place and old schoolhouse, 1614, restored 1868

electric trucks, Market Harborough is in the heart of the hunting country and is the centre of the Fernie Hunt. Market day, Tues. Pop. (1951) 10,400.

Marketing Board. In Great Britain, a government organization for cooperative marketing. Marketing boards are set up either for a given commodity, e.g. the milk marketing board, or for a certain group of producers, e.g. the empire marketing board. Their objects are to rationalise supply and distribution, to set a standard of quality, and to obtain fair prices for producers. They undertake research on behalf of their members and advertise their produce. To remove anomalies in distribution, they sometimes, as in the case of the milk marketing board, establish a pool to which all produce is

sold and from which distributors are supplied. The empire marketing board was established in 1926 on the recommendation of the imperial economic committee to develop trade between Great Britain and the empire, by carrying out market research in the mother country and popularising empire products through publicity campaigns; it was responsible for the national mark scheme for grading eggs, flour, malt products, home-killed beef, and certain fruits.

Market Overt or **OPEN MARKET.** English legal phrase. As a rule, if a chattel is taken from its true owner, the latter still remains the owner, even as against a purchaser who has given full value for it in good faith. The exception is in the case of a sale in market overt, if the sale is according to the custom of the market. It must not be by night; nor in a room or place to which the public have not free access; it must be for valuable consideration; and the buyer must not know of the defect in the seller's title.

Market Rasen. Market town and urban dist. of Lincolnshire, England. It stands on the Rase, 16 m. N.E. of Lincoln, with a rly. station. An old church is dedicated to S. Thomas. Race meetings are held five times yearly. Market day, Tues. Pop. (1951) 2,132.

Market Weighton. Market town and parish of the E. Riding of Yorkshire. It is 19 m. by rly. from York. It is connected with the Humber by a canal, and is an agricultural centre. Market day, Wed. Pop. (1951) parish, 2,080.

Markham, CHARLES EDWIN (1852-1940). American poet. Born in Oregon, April 23, 1852, he passed his boyhood on a farm in California, became a school superintendent, and devoted much time to the study of literature and Christian sociology. In addition to his most notable volumes of verse, *The Man With the Hoe* and *Other Poems*, 1899, and *Lincoln and Other Poems*, 1901, he wrote *The Children in Bondage*, 1909, dealing with child labour, and *California the Wonderful*, 1914. A collected edition of his poems appeared 1927. Markham died March 7, 1940.

Markham, SIR CLEMENTS ROBERT (1830-1916). A British traveller and geographer. Born at Stillingfleet, July 20, 1830, he was educated at Westminster, and entered the navy in 1844. Promoted lieutenant in 1850, he went with the expedition for the relief of Franklin. In 1852 he left the navy and undertook a journey to Peru.

Observations in that country led him to introduce into India the cultivation of quinine-yielding cinchona trees, 1859-62. Appointed to the geographical department of the India office, 1867-77, he accompanied the expedition to Abyssinia, 1867-68. He was secretary to the Royal Geographical Society, 1863-88, and president 1893-1905; he held similar positions in the Hakluyt Society, 1857-87. Knighted in 1896, he died Jan. 30, 1916. Amongst his works are *Franklin's Footsteps*, 1852; *Travels in Peru and India*, 1862; *Richard Hakluyt*, 1896; *The Lands of Silence*, 1921.

Markham, GERVASE (c. 1568-1637). English author. Born at Cottam, Notts, he was a member of an old county family, and seems to have received a good education. He became a soldier, seeing service in the Netherlands and in Ireland, but afterwards passed his time in writing. Little else is known save that he died early in 1637 and was buried in S. Giles's, Cripplegate, London. He wrote poems and dramas, also books on horses and agriculture, including *A Discourse of Horsemanship*.

Markham, MRS. (1780-1837). Pseudonym of Elizabeth Penrose, British writer. She was born on Aug. 3, 1780, at Goadby-Marwood, Leicestershire, the second daughter of the Rev. Edmund Cartwright, inventor of the powerloom, and she married the Rev. John Penrose in 1814. Her *History of England*, begun in the first instance for her own children and published in 1822, attracted little notice at first, but eventually became the leading school history for a period of some 40 years. Her *School History of France*, 1828, likewise achieved remarkable success. She died Jan. 24, 1837.

Markham, VIOLET ROSA (b. 1872). A British social worker. Daughter of a Derbyshire coal-owner, she was born Oct. 3, 1872. She took an active part in the women's trade union movement, and her experience in the organization of women workers, and wide knowledge of industrial law, led to her appointment as deputy director of the women's section of the national service department in



Violet Markham,
British social
worker

1917. Made C. H., 1917, she was mayor of Chesterfield, Derby, 1927. Member of the industrial court from 1920, and of the assistance board from 1934 (deputy chairman from 1937), she retired 1946. She presided over the committee on welfare and amenities of serving women in the Second Great War, and reported on domestic employment, 1945. Her early books were about South Africa, and in 1929 she published *Romanesque France*. She married in 1915 J. Carruthers (d. 1936).

Markhor (*Capra falconeri*). Species of wild goat, found in Kashmir and Afghanistan. It is



Markhor. Specimen of the wild
goat found in Afghanistan
W. S. Berridge, F.Z.S.

readily distinguished from all other goats by its massive horns, which are twisted either closely like a screw, or open like a corkscrew. A fine specimen stands about 3½ ft. high at the withers, the chin-beard often reaches nearly to the knees, and the colour varies from greyish brown to nearly white. Markhors are found among the mountains at varying elevations, and their wary habits render them difficult to approach.

Markievicz, CONSTANCE GEORGINA, COUNTESS (1868-1927). Irish politician. Born Feb. 14, 1868, she was the eldest child of Sir Henry Gore-Booth, bart., of Lissadill, co. Sligo, and sister of the poet Eva Gore-Booth (1870-1926). She studied painting at the Slade and in Paris, where she met Count Casimir Dunin de Markievicz (d. Dec. 2, 1932), a Pole, whom she married in 1900. They eventually settled in Dublin, where she became prominent among the extremists of Irish politics. For her part in the Easter rising, 1916, she received sentence of death, commuted to penal servitude for life. Released 1917, she was again arrested 1918 in connexion with an alleged German plot. Returned

as Sinn Féin M.P. for S. Patrick's, Dublin, 1918-21 (first woman elected to the British house of commons), she never took her seat. An ardent republican, she opposed the treaty of 1921. From 1921 until her death, July 15, 1927, she represented Dublin City in the Éire parliament.

Markinch. A police burgh and parish of Fife, Scotland. It is 33 m. due N. of Edinburgh. Industries include paper making, agricultural engineering, coalmining, blanket weaving, and whisky blending. Pop. (1951) 2,306.

Marking Nut Tree (*Semecarpus anacardium*). Evergreen tree member of the family Anacardiaceae. A native of the East Indies, it is also called the kidney bean of Malacca. It has alternate, oblong, leathery leaves, and small, greenish-white flowers in terminal clusters. The nut or bean is enclosed in a hard shell, attached to a pear-shaped, fleshy, yellow receptacle, which is roasted and eaten. The unripe fruit yields a kind of ink, and the corrosive juice of the shell is used as an external remedy for rheumatism and as a wart cure. Mixed with quicklime, the juice forms an indelible stain used for marking ink.

Markino, YOSHIO (b. 1874). Japanese artist and author. Born Dec. 25, 1874, at Koromo, he settled in the U.S.A. in 1893. In 1897 he came to London, where he rapidly achieved a reputation for clever drawings and writings illustrative of British life. He published *A Japanese Artist in London*, 1910; *My Recollections and Reflections*, 1913; *My Forty Years in England*, 1940; and illustrated in colour a series of travel books.

Markirch. A town of Haut-Rhin dept., Alsace, France. It is 36 m. S.W. of Strasbourg, standing on both sides of the Leber, and is a manufacturing centre, various kinds of textiles being woven and prepared. In the Middle Ages and until about 1800 silver, copper, and lead mines were worked here, hence its French name, Ste. Marie-aux-Mines. Pop. (1954) 8,078.

Markland (Norse, wood land). Name given in 1003 by the Norse explorer, Thorfinn Karlsefai, to a forested land with great stretches of white sand, which he found in North America. The identity of Markland has been much discussed, but it may have been Newfoundland. The discovery is related in the Icelandic *Flatey Book*, trans. in *The Discovery of N. America by the Northmen*, N. L. Beamish, 1841.



Markova. British dancer who won international fame in ballet

Mark Lane. London thoroughfare. It runs from Fenchurch Street to Great Tower Street, E.C., and contains the two Corn Exchanges, the older dating from 1828, and the newer from 1881. A market was held here in the Middle Ages. In the Second Great War the W. side of the lane was mostly destroyed by German bombs. The station on the Metropolitan rly. was renamed Tower Hill in 1946.

Mark Masonry. Side degree of Freemasonry. To this degree, excluded from craft masonry by the act of union of 1813, admittance is still limited to master masons, although the organization is quite independent of United Grand Lodge. The Grand Lodge of Mark Master Masons was founded in 1856, and also controls the degree of Royal Ark Mariner, membership of which is limited to mark master masons. The office of the Grand Lodge of Mark Master Masons is in Great Queen Street, London, W.C. See Freemasonry.

Markova, ALICIA. Professional name of Alice Marks, a British dancer. Born in London. Dec. 1, 1910, she studied under Asta-fieva, joined the Diaghilev company in 1924, and appeared in miniature ballets at the Ballet Club. With the Vic-Wells company, 1933-35, she became famous for her interpretations of the title-

part in Giselle and Odette in Swan Lake. She later founded a company in partnership with Anton Dolin (*q.v.*), and in 1938 appeared with the Ballet Russe de Monte Carlo. She danced at the Metropolitan Opera House, New York, 1943-45, and with the Festival Ballet, 1951-55.

Marks, HENRY STACY (1829-98). British artist. Born in London, Sept. 13, 1829, the son of a solicitor who turned coachbuilder, he was educated there, afterwards studying art in Paris. He first exhibited at the R.A. in 1853, becoming A.R.A. in 1871 and R.A. in 1878. He died Jan. 9, 1898. In early life Marks painted genre subjects, but later became well known as a painter of birds and pictures in which birds and human figures were strikingly associated.

Mark System. Name given to a system of landholding by which the land was held and cultivated in common by freemen, who managed their own affairs, and lived in self-governing communities. It was believed at one time that this was the usual method throughout Germany in the early centuries of the Christian era, and that it was brought to England by the Anglo-Saxons. This opinion is not now held widely. Some such system was very likely in existence in Germany and elsewhere, but not in the universal and rigid way that its advocates believe. The word is



Marlborough, Wiltshire. The wide High Street of this ancient town, looking towards the Market Hall

derived from mark or march, a border district, one which the freemen are supposed to have cleared of forest and occupied. See Manor; Village Community.

Marl. In geology, sedimentary deposit which is a mixture of calcium carbonate, clays, and sands. The word is loosely applied to a large number of friable clays of widely differing composition, and though most contain calcium carbonate, many so-called marls are almost entirely deficient in it. Blue or shell marl, consisting largely of

shells of mollusca, contains 40 to 50 p.c. of carbonate of lime, and a small percentage of potash and phosphoric acid. Eocene or chalky marl may contain up to 95 p.c. of the carbonate, while Cretaceous marls are valuable for their high proportion of potash and phosphoric acid, though low in their percentage of lime. Marls are used as fertilisers and as improvers of peaty and acid soils. Marlstone is the name given to the argillaceous limestone of the Middle Lias. See Limestone.

Marlborough. Mun. bor. and market town of Wiltshire, England. It stands on the Kennet, 11 m. S. by E. of Swindon and 76 m. W. of London, and is served by rly. The church of S. Peter is a Perpendicular building. The Castle Inn is one of the most famous of the old

coaching inns, for the main road from London to the W. ran through Marlborough, as does now the A4 road to Bath. There are a town hall and a 16th century grammar school. Marlborough College (*q.v.*) is a public school.

Marlborough was a settlement of the Britons and probably of the Romans. The Norman kings built a castle here, and their successors, especially Henry II, lived here occasionally, because it was convenient for the hunting in Savernake Forest. It became a borough in the Middle Ages, and was separately represented in parliament from 1295 to 1885. Market day, Sat. Pop. 4,600.

Marlborough Downs is the name given to a range of chalk hills lying to the W. of the town. There are remains of British camps. Below the Downs lies Avebury (*q.v.*).

Marlborough. N.E. county of S. Island, New Zealand. Its area is 4,220 sq. m. It contains the two Kaikouras ranges, the highest peak being 9,462 ft., is well timbered and fertile, and the Wairau is its only navigable river. It exports wool, timber, hides, and tallow. Blenheim and Picton are its chief ports. Pop. (1951) 17,451.



Marlborough arms

Marlborough, DUKE OF. British title borne since 1702 by the family of Churchill. From 1626 to 1679 there was an earldom of Marlborough held by the family of Ley, John Ley being the lord chief justice and lord treasurer. When the 4th earl died, in 1679, the title became extinct. In 1689, however, it was revived for John Churchill, who, in 1702, was made a duke. He left no sons, and by arrangement his titles passed to his eldest daughter, Henrietta, wife of the 2nd earl of Godolphin, and on her death to Charles Spencer, 5th earl of Sunderland, the son of Marlborough's second daughter. From him the later dukes are descended, and to him they owe the name of Spencer. George, the 4th duke, as

he is ranked, died in 1817, and his son, the 5th duke, in 1840. A younger son of the duke was made a baron in 1815. In 1902 the 3rd baron was made Viscount Churchill.



Charles, 9th Duke of Marlborough
Elliott & Fry

John Churchill the 7th duke, a Conservative politician and the father of Lord Randolph Churchill, was lord-lieutenant of Ireland 1876-80. George, the 8th duke, was succeeded in 1892 by Charles, the 9th duke (b. 1871). He was under-secretary for the colonies, 1903-05, and parl. secretary to the board of agriculture, 1917-18. Dying June 30, 1934, he was succeeded by his son, John Albert Edward William (born Sept. 18, 1897), as 10th duke. The duke's eldest son is called the marquess of Blandford. *See* Blenheim.

Marlborough, JOHN CHURCHILL, 1ST DUKE OF. English soldier. He was born probably June 24, 1650, of a good Dorset family, at Ashe, near Axminster. He entered the household of James, duke of York, as a page, became an ensign in the Guards, saw service at Tangier at the age of 16, won a colonelcy as the reward of courage and skill displayed under Turenne in the Netherlands, and then in 1678 married Sarah Jennings.

He held high command in the army of James II, but deserted him when William of Orange landed Nov. 5, 1688. William, on accepting the English crown, created Lord Churchill, as he already was, earl of Marlborough, and after the battle of the Boyne, June 30, 1690, left to him the conduct of a brief campaign in Ireland. The earl, however, now lost favour. Like most

other men of position, he was known by William to be intriguing with the exiled James II. The death of Queen Mary, however, Dec. 28, 1694, ensured Marlborough's loyalty, since it was entirely to his interest that the princess Anne should succeed to the throne. Accordingly he was reinstated in the favour of the king.

At the beginning of 1702, when war was on the point of breaking out, William selected Marlborough as the man who in his own absence should command the British and Dutch forces. William's death, March 8, 1702, placed Anne on the throne, and her accession confirmed the appointment of Marlborough. Hampered at every turn by the Dutch civilian commissioners whose assent was required to his military operations, and by perpetual intrigues at home, Marlborough nevertheless succeeded in manoeuvring the French out of one position after another, until he found his great opportunity in 1704.

Marlborough concerted his plans with Prince Eugene, arranged what was ostensibly to be a campaign on the Moselle, and then, before anyone suspected his intentions, swooped from the Rhine to the Danube, throwing himself between



Marlborough

After Sir Godfrey Kneller

the French and Vienna, and won the overwhelming victory of Blenheim, Aug. 13, 1704.

But the duke—his earldom had been raised to a dukedom in 1702—was still prevented as before from reaping the full fruits of his victory. It was not until 1706 that his hands were freed and he was able at Ramillies, on May 23, to strike another crushing blow, the result of which was that within four months

the French were cleared out of Brabant and Flanders. In the next year, 1707, he had to leave war for diplomacy, wherein he proved himself no less a master by averting the threatened intervention of Charles XII of Sweden. In 1708 the Spanish Netherlands revolted against the Dutch domination which had resulted from the victory of Ramillies, and again the situation was saved by Marlborough's brilliant victory over the French at Oudenarde, July 11.

So extreme were the demands made by the Allies upon Louis XIV that France refused the terms of peace. A sanguinary victory was won over the French at Malplaquet, Sept. 11, 1709. But the French defeat was not a rout, and Malplaquet was the last of Marlborough's triumphs.

Marlborough was paralysed for action by the turn taken by political events in England, and in 1711 a direct attack was made upon him for misappropriating public moneys. But for party spite his defence would have been conclusive—but in fact the issue of the attack was that he was deprived of all his offices and retired abroad. He was recalled on the accession of George I, Aug. 1, 1714; but his powers of mind and body were broken by a stroke of apoplexy in 1716, and he played no more part in public affairs. On June 16, 1722, he died, and was buried in Westminster Abbey.

Marlborough's name stands amongst those of the greatest of masters of the art of war known to history; the British army owes him an eternal debt of gratitude for his determined insistence on proper care and treatment for the men who were fighting the country's battles. As a diplomatist he was hardly less supreme than as a soldier. That he was grasping and avaricious, that he was perfectly capable of playing the traitor, even that he was guilty of treasonable acts, it is hardly possible to dispute. But the heaviest charges brought against him were never proved, and the presumptions are in his favour even when they were not definitely disproved. There is no Englishman who more decisively commands our admiration, no great Englishman for whom it is so difficult to feel a confident esteem. His character has been painted in the most unattractive colours by Macaulay. *See* Blenheim; Malplaquet; Oudenarde; Ramillies.

A. D. Innes

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Marlborough, SARAH CHURCHILL, DUCHESS OF (1660–1744). Daughter of Richard Jennings, of Sandridge, Hertfordshire.



Sarah Churchill,
Duchess of Marlborough
After Lely

she was born on June 5, 1660. As maid-in-waiting to the duchess of York, she became intimate with the young princess Anne, a friendship which had important political consequences. In 1678 she married John Churchill, afterwards 1st duke of Marlborough, and the princess's adherence to the husband of her friend in his political misfortunes brought a quarrel with her mother. On Anne's accession the duchess of Marlborough received high favours and exerted great influence. Her adoption of Whig principles, her uncontrollable temper, and the increasing influence, used against Marlborough, of Abigail Hill (Mrs. Masham) led to a breach between "Mrs. Morley" and "Mrs. Freeman," as the queen and duchess respectively called each other in private. Despite a temporary reconciliation, the duchess was finally dismissed from the court in 1710. She used her biting wit against Anne and the Tories, and in later life wrote a vindication of her husband and her own conduct. To the end she retained her vigorous and forceful personality, dying, Oct. 18, 1744. Consult Lives, A. T. Thomson, 1839; O. Colville, 1904; K. Campbell, 1932; F. Chancellor, 1932.

Marlborough College. English public school. Founded in 1843 for the sons of the clergy, it stands in large grounds in Marlborough. In 1853 it was thrown open to the sons of laymen. It is arranged partly on the hostel system and partly on that of boarding-houses. In college, on the former system, are about 430 boys, divided among eight houses, while outside are houses accommodating about 230 boys. There are scholarships to the school and the universities. The school is divided into lower, middle, and upper; there is also an army department.

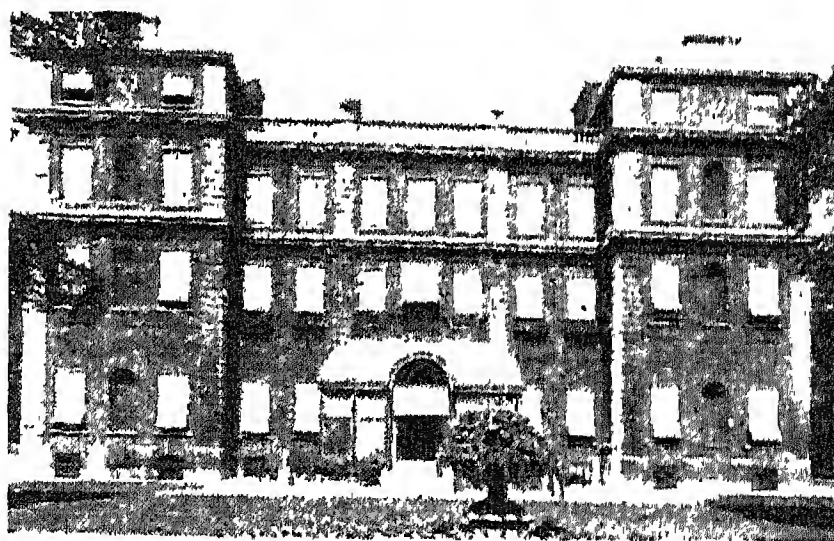
Marlborough House. London royal residence. Standing in a garden of four acres, between the S.W. end of Pall Mall and the Mall, it is of red brick, and was built by Wren in 1709–10 for the first duke of Marlborough, who died here in 1722, as did his

duchess in 1744. It was the residence, after his marriage to Princess Charlotte, of Prince Leopold, 1817–31; Queen Adelaide, widow of William IV, 1837–49; Edward VII, when prince of Wales, 1863–1901; George V, when prince of Wales, 1901–10; and Queen Mary, after the death of George V in 1936. It was the residence of Queen Alexandra in her later years. Marlborough House chapel, once connected with St. James's Palace, was built by Charles I. A memorial to Queen Alexandra, carried out in bronze by Sir Alfred Gilbert, occupies a site on the W. wall of the grounds.

Marlinspike. Pointed iron instrument used by sailors in knotting and splicing ropes. From 8 to 12 ins. in length, it enables knots that have jammed to be unfastened, the strands of a rope to be opened, etc. It often has an eye in the thick end for a lanyard.

Marlow OR GREAT MARLOW. Market town and urban district of Bucks, England. It stands on the N. bank of the Thames, 32 m. by railway W. of London. It has some manufactures, including plastics and beer, and is a boating centre. The church of All Saints is a modern building; there is a 17th-century grammar school. A suspension bridge, completed in 1829, crosses the river here. The royal military college, founded here in 1799, was moved to Sandhurst in 1812. A tablet marks the house in which Shelley lived and wrote. Marlow was a borough in the 13th century. It was separately represented in parliament until 1885, and had markets and fairs in the Middle Ages. Pop. (1951) 6,481. Little Marlow is a village on the river, 2 m. away.

Marlowe, CHRISTOPHER (1564–93). English poet and dramatist. Born at Canterbury, son of a shoemaker and parish clerk, he was educated at the King's School in the cathedral city, and Benet (Corpus Christi) College, Cambridge, graduating M.A. in 1587.



Marlborough House, London, one of the royal residences. The main front, overlooking the Mall

Adopting free thought in religion, he abandoned the idea of a Church career to write for the stage in London. Here he was attached as playwright to the lord admiral's company. Shortly after a warrant had been issued for his arrest on some unknown charge, he was killed by Francis Archer, a serving-man, in a brawl near Greenwich, at the end of May, 1593, and was buried in the churchyard of St. Nicholas, Deptford.

His first tragedy, *Tamburlaine the Great*, a play in two parts, each of five acts, produced by Alleyn's company about 1588, introduced a pliant, rhetorical, passionate, and resonant form of blank verse ("Marlowe's mighty line," Jonson called it), which gave a permanent stamp and lasting impetus to English romantic drama. The *Tragical History of Doctor Faustus*, containing some of the finest poetry in the language, was produced a year later, being followed by *The Jew of Malta*, in which Alleyn appeared as Barabas; *Edward the Second*, which best exhibits its author's skill as a playwright and was the first Elizabethan historical drama; *The Massacre at Paris*; and the unfinished *Tragedy of Dido*, completed by Nashe. Marlowe's dramatic construction is faulty, and he created no heroine. His principal heroes are men of humble origin and exemplars of the superman: *Tamburlaine* typifies the will to conquer by physical force, and proved tremendously popular with an audience stirred by the defeat of the Spanish Armada; *Faustus* symbolises the lust of knowledge.

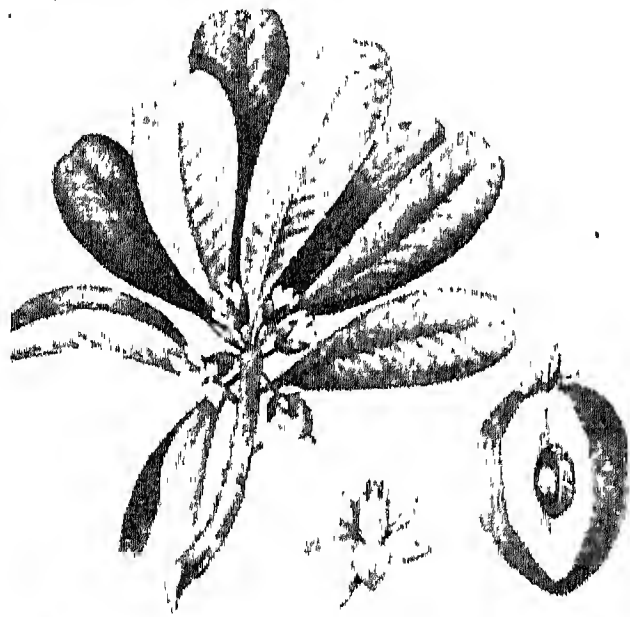
Marlowe, Shakespeare's chief creditor in the dramatic craft, may have collaborated with him in *Henry VI* and *Titus Andronicus*. His exquisite paraphrase of part of Musaeus's *Hero and Leander* was completed by Chapman and quoted by Shakespeare ("Who ever loved, who loved not at first sight?") in *As You Like It* (V, iii, 81–82). As a poet Marlowe also lives in his pastoral lyric, *Come, live with me and be my love*. He translated Ovid's *Amores*, and the first book of Lucan's *Pharsalia*. No portrait of him exists, and no original edition of his plays (which display the work of no other hands) except that of *Edward the Second*. A memorial, by Onslow Ford, was unveiled at Canterbury by Irving in 1891.

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Marmalade (Port. *marmelo*, quince). Name commonly given to a preserve of Seville oranges. Originally a kind of quince jam, it is sometimes particularly designated orange marmalade, especially as other citrus fruits, e.g. lemon, lime, grapefruit, are now similarly preserved. See Jam.

Marmalade Box (*Genipa americana*). Popular name for the ever-green genipap (*q.v.*).

Marmalade Tree (*Lucuma mammosa*). Tree of the family Sapotaceae, native of S. America.



Marmalade Tree. Leaves and flowers. Inset, left, single flower; right, section of fruit

It has large leathery leaves of oblong shape, 1-2 ft. in length, and small, solitary, whitish flowers. The fruit is more or less oval, 4-5 ins. long, with a rough, rusty brown skin, and a single seed embedded in a luscious, edible pulp, with a flavour akin to that of quince marmalade.

Marmande. Town of France, in the dept. of Lot-et-Garonne. It is 49 m. by rly. S.E. of Bordeaux on the right bank of the Garonne. It contains a fine Gothic 13th-century church, and makes brandy and liqueurs, linens and woollens. Pop. (1954) 12,368.

Marmara OR MARMORA, SEA OF. The ancient Propontis, separating S.E. Europe from Asia Minor. It is connected with the Black Sea by the Bosphorus, and with the Aegean by the Dardanelles. With an area of 4,500 sq. m., it is 175 m. in length, and at its broadest is about 50 m. wide. It derives its name from its largest island, which is famous for marble quarries. Among its other islands is the

group called Princes' Islands. The strict control over the two passages to the Sea of Marmara imposed by the treaty of Sèvres in 1920 was relaxed in favour of Turkey by the Straits treaty signed in 1923 at Lausanne, and by the Montreux convention (*q.v.*). See Dardanelles, Attack on; Gallipoli; Turkey.

Marmion: A TALE OF FLODDEN FIELD. Second of Scott's metrical romances, published 1808. The poem is in six cantos, each prefaced by an epistle to a friend. Its story is that of the Scots war against Henry VIII which ended in the death of James IV and the destruction of his nobility at Flodden, Sept. 9, 1513.

Marmolata. Highest mountain of the Dolomites (*q.v.*). It lies in the Italian prov. of Belluno, 6 m. W. of Caprile. The N. slope is gradual, while the S. side descends precipitously. Of its peaks, Punta di Penia reaches over 11,000 ft., and Punta di Rocca 10,855 ft.

Marmont, AUGUSTE FRÉDÉRIC LOUIS VIESSE DE (1774-1852). French soldier. Born at Châtillon-sur-Seine, July 20, 1774, the son of a soldier, he entered the revolutionary army in 1791. Known to Napoleon as a fellow student, he became his aide-de-camp, served in Italy and Egypt, and was made a general. He held commands at Marengo and Ulm, after which, 1805-09, he was governor of Dalmatia and drove the Russians from Ragusa. In 1810 he took command in Spain, where, after capturing Ciudad Rodrigo, he was beaten at Salamanca. He appeared next in Napoleon's lost battles of 1814, after which he surrendered with 20,000 men under conditions that seemed reasonable. He was honoured by the restored Bourbons, whom he served after 1814, and in whose cause he became an exile in 1820. He lived in Vienna and elsewhere until his death at Venice, March 22, 1852. Marmont, who was made a marshal and duke of Ragusa by Napoleon,



Marmot. Specimen of the Alpine species, *Arctomys marmotta* W. S. Berridge, F.Z.S.

wrote some volumes of Memoirs, published in 1856.

Marmoset (*Haplorhinae*). Family of very small monkeys, found only in Central and S. America. They are



Marmoset. A pair of the lion variety from Brazil

placed at the foot of the sub-order which includes the monkeys, apes, and man; and in general form nearly approach the lemurs. They are somewhat squirrel-like in general appearance and size, are covered with thick fur, and have non-prehensile tails which are often bushy. The face resembles that of a miniature monkey, and many species have tufts or fringes on the ears. The feet and hands of the marmoset differ considerably from those of the monkeys proper, the toes and fingers being provided with claws instead of nails, except for the great toes. There are no cheek pouches and no bare callosities on the buttocks. In dentition also they differ from the rest of the monkeys. They live in the trees and climb about like squirrels. They are usually found in small companies, and their food consists of insects and fruit. In disposition marmosets are gentle and timid; they rarely live long in captivity.

Marmot (*Arctomys*). Genus of rodents, placed by zoologists in the same family as the squirrels. They are found in the N. portions of both hemispheres, and include numerous species. Very stoutly built, somewhat resembling rabbits, but without the characteristic ears and long hind legs, they range from 14 to 24 ins. in length. Their coarse fur is yellowish brown, and usually darker along the middle line of the back. Europe possesses two species, the Alpine marmot, now occurring in the Alps, Pyrenees, and Carpathians, but formerly of much wider range, and another

species, commonly known as the bobac, smaller in size, ranging from Germany and Poland across S. Russia into W. Siberia. Other species occur in Central Asia, and N. America has several, of which the woodchuck is perhaps best known. All marmots live upon seeds, roots, and leaves, move about in the daytime, and live in burrows, usually occupied by large colonies. Many species hibernate. See Woodchuck.

Marne. River of France. It rises in the Langres plateau and flows, in general, N.W. through Champagne to join the Seine at Charenton, a S. suburb of Paris. Its tributaries are the Ourcq, Saulx, and Ornain, on the right, and the Grand Morin and Petit Morin on the left. Over 200 of its 326 m. are navigable, and it forms part of the Marne-Rhine canal navigation, while the Haute Marne canal joins it to the Saône. The main stream and the tributaries in the neighbourhood of Meaux flow in trenches carved below the general level of the E. side of the Paris basin.

The battles of the Marne in 1914 and 1918 are described in a separate article. During the brief campaign of 1940, the Germans reached the Marne near Château-Thierry on June 11, and established bridgeheads on the S. bank next day. The French, faced with vastly superior mechanised forces,

were compelled to retreat from the line of the river. On Aug. 27, 1944, U.S. armoured forces reached the Marne near Lagny, meeting little opposition; next day formations crossed the river at Meaux and near Château-Thierry.

Marne. Dept. of France, formerly part of the prov. of Champagne. It lies contiguous with the depts. of Ardennes, Meuse, Haute-Marne, Aube, Seine-et-Marne, and Aisne. To the N. of the dept. are the wooded hills of the Reims district, but the chief physical feature is the bare, chalky tract known as the Champagne Pouilleuse. The Marne flows in a N.W. direction through the dept., other rivers including stretches of the Aisne and Aube, and numerous small tributaries of the Marne. The Aisne-Marne and Marne-Rhine canals are notable.

The principal product is champagne wine, but miscellaneous agriculture and fruit growing are also carried on; the industries include woollen manufactures, dyeing, chalk and marble quarrying, foundries, etc. The capital is Châlons-sur-Marne, and among other towns are Reims, Épernay, Ste. Menchould, and Vitry-le-François. The dept. suffered severely in the First Great War, especially in the tract from Reims across the Camp de Châlons to Suippes. Area 3,167 sq. m. Population (1954) 415,141.

MARNE: BATTLES OF 1914 AND 1918

Major battles of both the First and the Second Great Wars are described in detail in this Encyclopedia (see Aisne; Jutland; Somme; Ypres, etc.). This article deals with that battle which first arrested the German advance in 1914, and with two decisive and almost simultaneous Allied victories of 1918, one defensive, the other offensive. See First Great War

The first battle of the Marne, fought Sept. 6–10, 1914, was one of the decisive battles of the First Great War, indeed of history. It marked the first check of the German forces after the initial impetus of their advance into France, and was their first decided defeat. This turning of the tide appeared at the time so inexplicable as to be almost miraculous.

Joffre, French C.-in-C., had learned from airmen's reports that the German 1st army, under von Kluck, was marching from N.E. of Paris to a point E. of Paris to support the German 2nd army, under Bülow, in crushing the French 5th army. The German right flank was thus left exposed. The German 1st army commander, von Kluck, believed the British army demoralised, and did not

know of the new French 6th army assembling on his right flank nor of the new French 9th army in the Allied centre. The opposing forces from W. to E. were, on the Allied side, the French 6th army, the British army, and the French 5th, 9th, 4th, and 3rd armies, a total of 51 divisions; on the German side, the 1st, 2nd, 3rd, and 5th armies, totalling 40 divisions. Altogether, about 450,000 Germans faced about 600,000 Allied men at the outset of the battle. The Germans retained immense superiority in heavy artillery, aircraft, and equipment. But their communications were faulty; the Belgian resistance had dislocated their plan of campaign; and the unexpected vigour of the Russian attack in the E. had led them to divert two corps to that front.

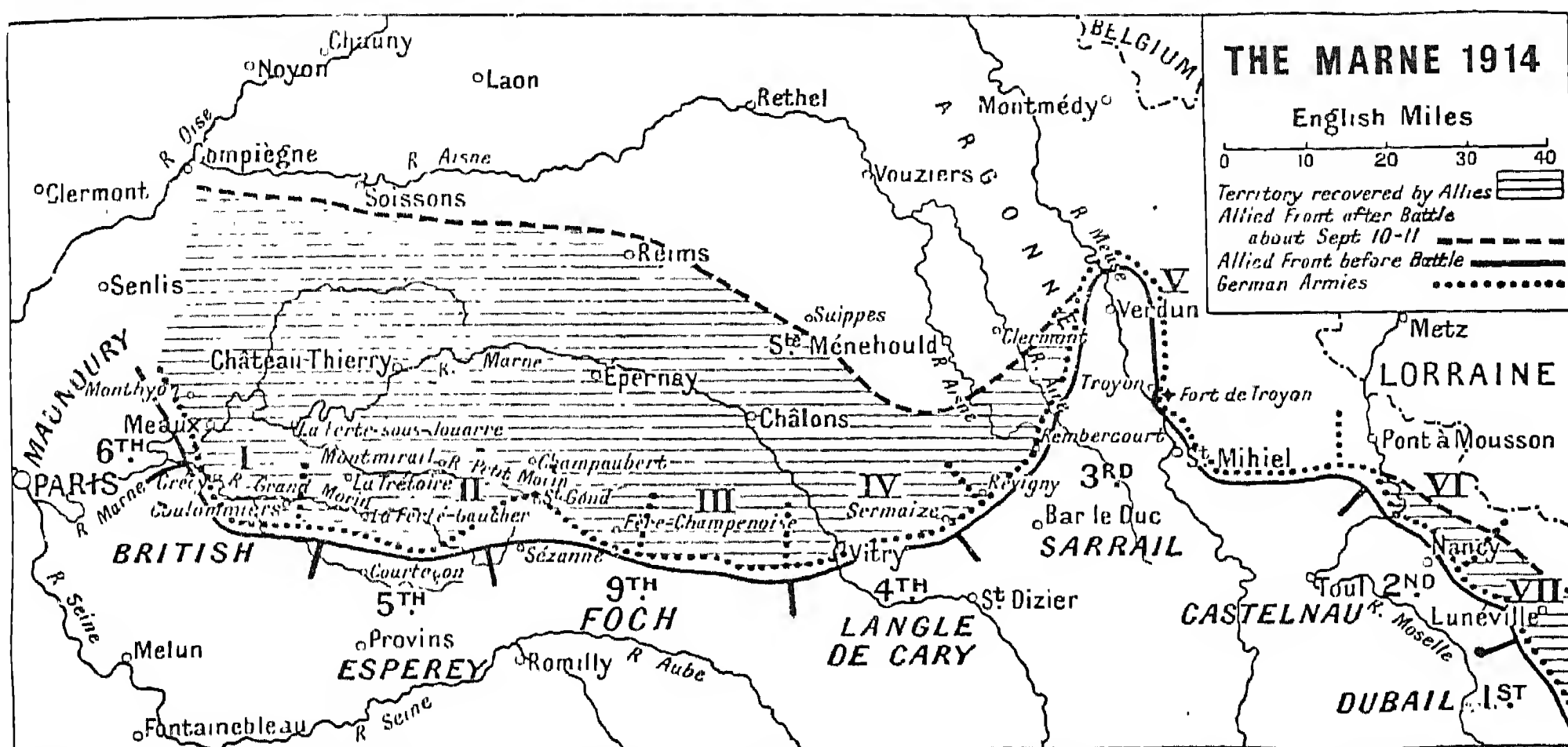
On Sept. 4, Joffre ordered the Allied armies to assume the offensive on Sept. 6, to profit by the "adventurous" position of the German 1st army, and to concentrate against it the efforts of the Allied armies on the left. He called on his troops, if they found it impossible to advance, to "stand their ground at all cost and die rather than give way."

The Opening Phase

On Sept. 5, the artillery of the French 6th army opened fire on the Allied left, the German artillery replied, and artillery fighting continued all that afternoon. On the next day, a Sunday, the main battle began. During the night Kluck had ordered two of his four corps S.E. of Paris to march to the aid of his corps opposite the French 6th army, and during the day he also recalled the other two, thus leaving an enormous gap between his 1st army and Bülow's 2nd army, apparently in the belief that the British facing him were incapable of any action. The French 6th army meanwhile attacked northward from Meaux with great energy and gained ground in the face of deadly artillery fire. On their right the British advanced slowly across the forest of Crécy to the Grand Morin. The French 5th army forced the German 2nd army northwards across the Marne in prolonged fighting, bending in Bülow's right flank and threatening his whole position. The French 9th army could do no more than barely hold its position against great German attempts to break through, the 4th army was forced back slightly, while the 3rd army held the attacks of the German 5th generally in check, though losing ground S. of the Argonne.

Gap in German Front

On Sept. 7, Kluck's movement of his whole 1st army to the Ourcq imperilled the French 6th army. It was at this moment that Gen. Gallieni, recognizing the danger, hurried aid to that army in the requisitioned taxicabs of Paris. Meanwhile the concentration on the Ourcq of Kluck's entire force created that gap in the German front which proved fatal to their plans. The British, delayed by a German cavalry screen and by machine guns, thrust into the gap, reaching the Petit Morin after seizing Coulommiers. The 5th army pushed back Bülow's right some 6 m., and was also able to detach a corps to aid the 9th army, still violently attacked and



Marne. Map showing how the German advance was arrested by the French and British armies, and the line forced back beyond Reims after the 1st battle

hard pressed, but holding its ground. The 4th army also held on, though its connexion with the 3rd was imperilled. The 3rd army was engaged fiercely, for the fall of Maubeuge that day set free a German corps and vital railways at a moment when German supplies and ammunition were low.

On Sept. 8 each of the opposing armies attempted to outflank the other; the British continued their advance, crossing the Petit Morin and violently shelling the Marne bridges; and the 5th army, crossing the Petit Morin, captured Montmirail, and widened the gap in the German front. The 9th and 4th armies were again violently attacked, yet held their ground, the 3rd even advancing slightly.

On Sept. 9 fresh German troops of Kluck's army continued to assail the French 6th, but Kluck was now in imminent danger of being enveloped on both flanks. At the critical moment the German staff lost heart, and ordered a general retreat to the Aisne. The retirement began that afternoon. It was accentuated all along the line on the following day, when Kluck's army was placed under Bülow. The Allies were soon in pursuit, in pouring rain. By Sept. 12 the Allies had advanced rapidly to the Aisne; the 9th army reached Épernay and Châlons, and on Sept. 13 occupied Reims; the 4th army seized Vitry-le-François; the 3rd army pushed up to the railway line from Verdun to St. Ménehould. The Germans were approaching or had actually reached the line which, after the ensuing 1st battle of the Aisne they were to fortify and

hold, with little change, until 1916. (See Aisne Battles.)

The net result of the battle was that the French armies, after a fortnight of defeat and retreat, had (with the British) taken the initiative, driven back the Germans 35 miles, and thus saved Paris and probably France. Certainly it put an end to German hopes of a speedy and victorious end to the war. French generalship was of a high order, particularly that of Galliéni. The British were criticised for the slowness of their movements, and Galliéni himself held that French cavalry should have exploited the victory more completely. German critics blamed both Moltke and the Kaiser for their defeat, first for withdrawing troops for the east; secondly for leaving a large force in Belgium; thirdly for attempting to break through at Nancy without a sufficiently large force for such an operation. The French claimed 38,000 prisoners, but no exact total of French casualties was given, as the figure of 300,000 published after the war included losses in the retreat and in the Lorraine battles of the same month.

Second Marne Battle

The second battle of the Marne was fought July 15-17, 1918, and began with a German offensive, following the earlier great German attacks which had been brought to a standstill on other parts of the front. The object of Ludendorff's attack was the capture of Reims, to be followed by a fresh offensive in Flanders which he hoped would end the war. The German force consisted (W. to E.) of the 7th, 1st, and 3rd armies (50 divisions). De-

fending the section were the 10th, 6th, 5th, and 4th armies, with strong U.S. forces intercalated on the French line.

Pétain, commanding the French, was well informed of the German plans, and withdrew the bulk of Allied troops from advanced positions on his 4th army front, leaving only strong, detached points which were to be held to the last. The attack, postponed for three days through bad weather, was planned by the Germans to open suddenly with artillery fire at 1.10 a.m. on July 15, the infantry beginning their storm at 4.30 a.m. But these plans were discovered by the French, who surprised the Germans by opening their own bombardment first, on the evening of the 14th. When the 7th German army crossed the Marne during the early morning, they were already weakened by heavy losses from shells and machine-gun fire. Only 3 m. S. of the river they struck the main French positions, meeting French and U.S. troops. The resistance of the U.S. 3rd div. disorganized the attack, and the advance here was checked, with enormous German losses. S.W. of Reims the assailants gained some important ground, but were unable to push on, as intended, to Épernay. On the French 4th army front the German bombardment wasted its shells on the advanced French positions. Reims itself was heavily bombarded, but French troops there, sheltered in vast wine cellars, suffered little.

Next day the French counter-attacked with great success, and at noon the German 1st and 3rd armies were ordered to suspend

studied art in Paris, where his *Young Girl playing with a Dog*, 1829, attracted some attention. He executed the relief of the battle of Jemappes on the Arc de Triomphe, made some successful statues, that of Emmanuel Philibert at Turin, 1833, being one of the best, and after the revolution of 1848 came to London, where he enjoyed a certain vogue. Two of his best known works in England are the statue of Richard Coeur de Lion at Westminster, and the Inkerman memorial in St. Paul's. He died at Passy, Paris, June 4, 1868.

Marolles OR MAROILLES. One of the square cheeses of France, with a brownish skin. It is small and heavy, made of whole milk and fermented, with a strong taste and smell, and semi-hard. It is made at Maroilles, in French Flanders, also in other places in N. and E. France, during winter and spring.

Maronites. A tribe of Syrian Christians, living mainly in the vicinity of Damascus. Converted to Christianity in the 8th century by a monk, John Maro, who became their bishop, they held the Monothelite heresy until 1182, when they joined the Church of Rome, only to leave it 200 years later. In 1445 they were reconciled to the pope. They are largely independent, elect their own patriarch, and retain their own liturgical usages. They have about nine bishops, and have been much persecuted by the Druses.

Maroon (Fr. *marron*, chestnut). Device used for producing a loud report. It is a cylindrical box of pasteboard filled with gunpowder, strongly bound with twine, and primed with quickmatch. Maroons were fired in London during the First Great War to give warning of imminent enemy air raids, and until 1938 marked on Armistice Day the beginning and end of the two minutes' silence. Traditionally they precede public displays of fireworks.

Maroons. Name given to certain negro inhabitants of Jamaica. It is an adaptation of the Span. *cimarron*, applied by the Spaniards to runaway slaves who escaped to the mountains (*cima*, mountain-top). On the expulsion of the Spaniards from Jamaica in 1658 their slaves took to the hilly interior, and were long a source of trouble to the British, who abbreviated *cimarron* to maroon.

Maros (Rum. Mures). Hungarian name of a river of Hungary and Rumania. It rises in the Carpathians in the E. of Transylvania

and describes a great curve to the N. until, just above Deva, it flows W. to join the Tisza (Theiss) near Szeged. Below Nagylak it passes through Hungary. Its chief tributaries are the Aranyos (Auraru) and the Great and Little Kuküllö (Tarnava). The chief towns on its banks are Arad, Deva, Karlsburg (Alba Julia), and Maros Vásárhely (Osorrei). It is navigable for small craft for half its length of 500 m., and its valley provides one of the two easy routes from the Alföld to the Transylvanian plateau.

Marot, Clément (1496-1544). A French poet. He was born at Cahors, the son of a man of letters,



Clément Marot.
French poet

and at the university of Paris studied law. He gave time to verse making, and was soon a member of the court circle. Francis I took a fancy to him, as did his sister, Margaret, duchess of Angoulême, and Marot was taken prisoner at Pavia when in the king's train. In 1526 he was arrested for heresy, and later his liberal ideas got him into trouble. In 1535 he took refuge in Italy, but soon abjured his heretical opinions and returned. He was again an exile, however, when he died at Turin. A popular translation of the Psalms, condemned by the Sorbonne, was one reason for his flight. As a poet Marot tried many styles, but excelled in the lighter and more familiar forms, his *chansons* being characterised by natural ease and courtly grace. His influence on French literature was considerable, for he was one of the first to break away from conventional poetic forms. His complete works were edited by P. Jannet, 1873-76.

Marozia. Italian princess of the 10th century. Daughter of Theodora and the consul Theophylact, she married successively Alberic, duke of Spoleto, in 906, Guido of Tuscany, and Hugo of Provence, king of Italy. Ambitious and unscrupulous, she deposed and put to death Pope John X in 928, and three years later installed her bastard son as pope. Calling herself Senatrix of the Romans, she maintained her rule until 932, when she was imprisoned by Alberic, her son by her first husband, and disappeared from history.

Marple. Urban dist. of Cheshire, England. It stands on the river

Goyt, on the borders of Derbyshire, and is also served by a canal and is a rly. junction, 12 m. S.E. of Manchester, of which it is practically a residential suburb. The chief industry is cotton manufacture. Cattle market, Mon. Pop (1951) 13,073

Marprelate Controversy. A literary dispute between the Puritans and the Established Church of England in 1588-90. It was started by a series of seven secretly printed tracts, signed Martin Marprelate, Gentleman, Martin Junior; and Martin Senior. The first appeared about Oct., 1588, and, with its fellows, was followed by replies in kind written by Thomas Cooper, bishop of Winchester, Thomas Nashe, John Lyly, and others. Martin appears to have been a scholar of Oxford, a theologian, and a man of means—possibly Job Throckmorton. The tracts employed satire, wit, raillery, and racy gossip in attacking abuses in Church and state and the character of certain bishops. Archbishop Whitgift proceeded mercilessly against all suspected of complicity in their production and circulation, John Penry, the printer, being hanged in 1593. The secret press was carried on at East Molesey, Fawsley, Coventry, and Manchester, where it was seized in Aug., 1589.

Marquand, John Phillips (b. 1893). American novelist. He was born Nov. 10, 1893, and educated at Harvard. He published *Unspeakable Gentlemen* in 1922, and became known as a stylist with *Four of a Kind*, 1923, and later novels. The series of adventures of a semi-Oriental amateur detective, Mr. Moto, began in 1936 with *Thank you, Mr. Moto*; this character was a success on the screen when interpreted by Peter Lorre. Later books included *H. M. Pulham, Esq.*, 1941; *So Little Time*, 1943; *Point of No Return*, 1949; *Sincerely, Willis Wayde*, 1955.

Marquesas. Group of French volcanic islands in the Pacific Ocean. They are 900 m. N.E. of Tahiti, N. of the Low Archipelago. Nukahiva and Hivaoa are the largest of the 13 islands, seven of which are inhabited; Resolution Bay, on Tahuata, and Port Jarvis, on Roapoa, are the chief harbours. The interiors are hilly and the cliff coasts render access difficult. Copra and pearl shells are the chief products. The S. islands were discovered by Mendaña in 1595, those to the N. in 1791 by Ingraham, who named them the Washington



Marquesas. Natives of the islands

Is. They became French in 1842. Area, 480 sq. m. Pop. (1951) 2,988.

Marquess or **MARQUIS**. Title of nobility. Etymologically the same as margrave, count of the march (border). the word was occasionally used in England in this sense for the guardians of the Scottish and Welsh marches. In the British peerage the title ranks between duke and earl; it was introduced in 1385 by Richard II, who made his favourite Robert de Vere marquess of Dublin. British marquesses are by courtesy most honourable; the wife of a marquess uses the title marchioness.

Marquetry (Fr. *marqueter*, to inlay). Mosaic of ornamental woods, metals, or ivory, inlaid in furniture and smaller articles. In Venice, in the 15th century, caskets were inlaid with geometrical shapes of wood and ivory, and the Italian "intarsia" work of the 16th century was at first geometrical, and later developed into pictorial design. By the end of the 17th century marquetry in a number of intricate designs was being applied to Continental furniture. The English furniture makers of the 18th century employed it freely. Earlier marquetry was executed with woods of natural hues. Later, stained woods were employed, particularly after the discovery by a Frenchman named Boucherie of a process whereby wood could be stained to a considerable depth. See Furniture; Inlaying; Mosaic.

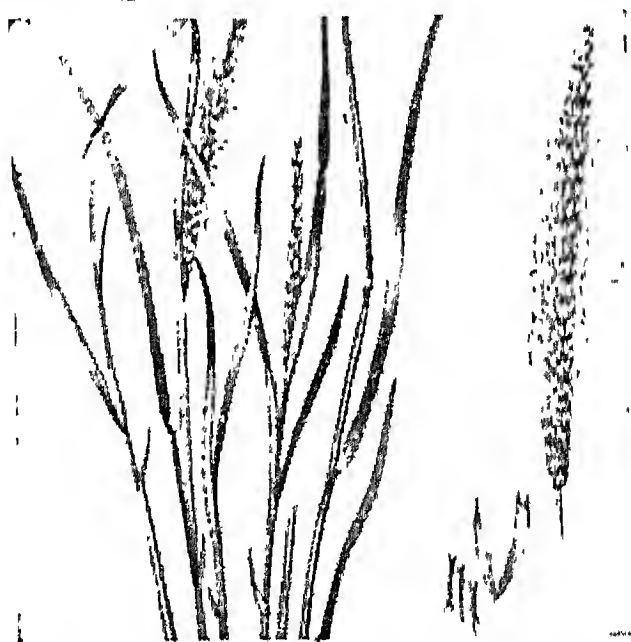
Marquette, JACQUES (1637-75). French explorer. Born at Laon, he joined the Jesuits, and in 1666 was sent out to Canada. There he engaged in missionary work among the Indians who lived around the Great Lakes until, in 1673, he and Louis Joliet set out to explore

the Mississippi. Marquette died on a missionary journey, May 18, 1675.

Marrakesh. City of Morocco, the S. capital of the country. It is situated on the N. end of a fertile plain, about 4 m. S. of the river Tensift. It is surrounded by a wall, and contains many ancient but dilapidated buildings and several notable mosques, including the Kutubia or mosque of the scribes.

The sultan's palace stands outside the walls and covers about 200 acres. Standing within easy reach of the Atlas Mts. and commanding the trade routes to the S., its commerce was important, and it is still the centre of a large trade. Pop. 241,000.

Marram Grass (*Ammophila arenaria*). Perennial grass of the family Gramineae. Marram is a native of the sea-shores of Europe and N. Africa. It has a long, branching rootstock which creeps under the blown sand, and its numerous rigid stems, 3 or 4 ft. high, bear long, stiff leaves which are rolled up from the side. The flowers are grouped in a long, rounded panicle. This grass is most valuable on account of its work in binding the dry, shifting sands and forming the dunes, making them sufficiently stable for other sand-plants to cooperate in preventing the loose sand from blowing far inland.

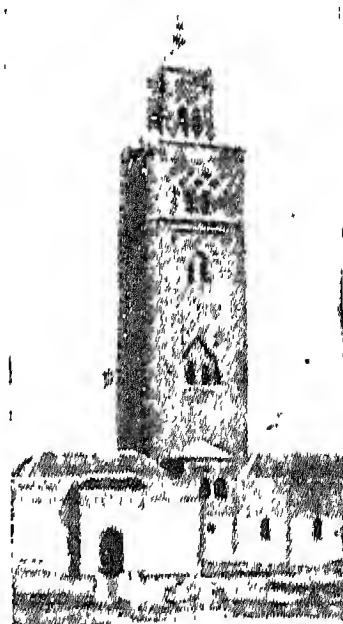


Marram Grass. Leaves and flowers of this perennial grass. Right, flower panicle and single flower

Marriage (Lat. *maritus*, husband). Union of man and woman sanctioned by the community. This social institution has the twofold purpose of regulating sexual relations for the common weal, and establishing the status of the offspring. It serves to define the rights and obligations of the parties and their children, and to determine descent and succession to property and rank. In all stages of culture disregard of the procedure

imposed by custom is visited with social reprobation and attended by disabilities. When, in advanced

societies, it is regarded as a contract, and as such is formally sanctioned by the church or state, wedlock is not terminable at will but only by the mechanism of the accepted legal proceedings.



Marrakesh. Lower picture, Kasba gate in the city walls. Upper picture, Kutubia mosque

Westermarck's minimum definition of marriage as a union lasting till after the birth of the offspring recognizes it as something more than mere mating; as something that involves living together for mutual helpfulness and protection, and the rearing of the family as well as for procreation. The social instinct, like the parental, is rooted in the psychological life, and in its noblest aspect marriage is held to be a spiritual as well as physical union.

The intercourse of certain near relatives is regarded by mankind with abhorrence, though the prohibited degrees vary from culture to culture. Sometimes it is dictated by caste pride, as in the royal families of ancient Egypt and Peru, though then the recorded instances of brother-and-sister marriage are often concerned with half-brothers and half-sisters. Among the Vedda marriage of a brother with a younger sister was regarded as the ideal union, though marriage with an older sister was considered incestuous.

Physical aversion or social disapproval tends to inhibit some unions which would be unattended by legal disabilities, such as those which offend against the law of

similarity. Among these may be classed those, marked by wide disparity of race, class, age, or religion, which are held to lack the essentials of domestic sympathy. Child-marriage, distinguishable from infant betrothal, may, as in orthodox Hindu circles, involve the deplorable sequel of perpetual widowhood.

The phenomena of courtship are observable among all peoples. Except in special circumstances the man is the wooer, and much freedom of choice occurs in the lowest as in the highest levels of culture.

Forms of Polygamy

Marriage is either monogamous or polygamous. Monogamy consists in the union of one man with one woman. Polygamy, which denotes plurality of husbands or plurality of wives, comprises three forms: polygyny, the marriage of one man with more than one woman; polyandry, that of one woman with more than one man; and the hypothetical communal or group-marriage, the sanctioned union of more than one man with more than one woman. Polygyny is widespread in human society, but where it occurs is usually practised only by men of power or means. The wives may be of co-ordinate rank, whether living together or in separate establishments; when a special status is accorded to the chief wife and her offspring, that of the other wives tends to pass into one of legal concubinage. Polyandry, of diminishing extent, survives in Tibet and among the Nayars of S. India.

MARRIAGE CUSTOMS. The manner in which the institution of matrimony reached the level of formal contract is best observed by reference to the customs which attend it. Various considerations led at an early stage to the formulation of rules binding men to find their wives either within their own social group, hence called endogamous, or outside it, thus giving rise to the principle of exogamy. An early form of exogamy was the forcible seizure of extratribal women, either singly, as with Persephonē, or in the mass, like the rape of the Sabines. The tribe of Benjamin practised it both in battle and at village feasts (Judges 21). Marriage by capture may also be intertribal, often denoting an attack upon prescriptive clan-right. In some Australian tribes the captive is stunned; she may be abducted on horseback with pretended pursuit, as among the Yakut; there may be realistic fights among the relatives, as in the New Hebrides.

Marriage by purchase (cf. Ruth 4) is a widespread recognition of clan-right or family-right; the bride-price is a compensation for economic loss. It is based upon the local measure of value: mares in central Asia, reindeer among the Samoyeds, cattle in Bantu Africa, pigs in the New Hebrides, bead-money on the lower Congo, arrows among the Pygmies, shell-money in California. Marriage by service, as with Jacob and Laban, is a well-established variant. The servitude may precede marriage, as with the Chukchi, or follow it, as in aboriginal N. America. The latter is usually indistinguishable from *beena* marriage, the matrilocal custom of residence by the husband with the wife's people.

The dowry, as the converse of the bride-price, arises under social conditions that relieve the wife of the duty of economic labour. It is often given in kind, such as a cow among the Yugoslavs, or mats in Polynesia. In some communities it is indistinguishable from husband-purchase. It is normal in Aryan India and in modern Europe. See Betrothal Customs; Concubinage; Dower; Family; Kinship; Society.

E. G. Harmer

Bibliography. Marriage Customs in Many Lands, H. N. Hutchinson, 1897; History of Human Marriage, E. A. Westermarck, 3rd ed. 1901; History of Matrimonial Institutions, G. E. Howard, 1901; Marriage and the Family, R. E. Baber, 1939.

Marriage Law. Marriage is "the voluntary union for life of one man with one woman to the exclusion of all others." In England the law was consolidated in the Marriage Act, 1949. Before two persons can marry they must be at least 16 years of age; of sufficient mental capacity to understand the nature of the contract they are entering into; not within the prohibited degrees of relationship; physically capable of consummating the marriage, and not validly married to any other person. A marriage may take place (1) according to the rites of the Church of England; (2) in a nonconformist or R.C. church or other registered building; (3) in a superintendent registrar's office; (4) according to the rites of the Society of Friends or the Jewish faith. The necessary formalities differ in each case.

A special licence can be obtained from the archbishop of Canterbury which makes it legal for the marriage to be solemnised according to the rites of the Church of England without publication of banns, at any convenient

time and place, and not necessarily in a church. Special licences are, however, granted very rarely and usually only for the marriage of persons of public importance, the licences which are in common speech sometimes referred to as "special" licences being in fact not special licences but licences granted by a superintendent registrar (see below).

Church of England Marriage

Except where a special licence has been obtained, marriage according to the rites of the Church of England must be celebrated in a church of the Church of England either after publication of banns or on a common licence from the bishop dispensing with banns or on a certificate obtained from a superintendent registrar. If the marriage is by banns, these must be published on the three previous Sundays in the parish church of the parish or parishes where the parties live. They may be married in some other church of the Church of England which is the usual place of worship of one of them if the banns are also published there. Instead of banns, the parties may in exceptional cases obtain a common licence from the bishop of the diocese or a certificate from the superintendent registrar. To obtain a certificate 21 days' notice must be given to the superintendent registrar of the district or districts in which the parties must have resided for seven days. A marriage may be solemnised in a church with a certificate instead of banns only if the clergyman consents. A clergyman must not without just cause refuse to marry a parishioner; but he may, so long as the former spouse is alive, refuse to remarry a person whose previous marriage has been dissolved, whether the person to be married again was the guilty party or not, nor need he allow the use of his church for such a marriage. He may also refuse to marry a man and his deceased wife's sister, a man and his deceased brother's wife, or persons who are related as nephews or nieces by marriage; he must, however, in such cases allow his church to be used by another qualified clergyman if required.

A marriage in a church of the Church of England must be solemnised by a priest or deacon. There must be two witnesses. The use of the words of the marriage service is not essential, nor is the putting of a ring on the bride's finger. On the joining of the hands of the parties and the

pronouncement by the clergyman that they are man and wife, the marriage is complete so long as they understand that as a result of these acts they become married to one another, and to one another only, until death parts them. Marriages, other than those with a special licence, or according to the usages of the Society of Friends, or of the Jews, must take place between 8 a.m. and 6 p.m.

Marriages in nonconformist and R.C. churches and other buildings registered for the solemnisation of marriages may be performed on a superintendent registrar's certificate, or on a superintendent registrar's certificate with licence. A certificate with licence can be obtained one whole day after the notice of marriage has been given; 15 days' prior residence by one of the parties is necessary. The registrar of marriages may be required to attend the ceremony. Two witnesses must be present, and the marriage must be solemnised with open doors between 8 a.m. and 6 p.m. Any religious ceremonies may be used, but each party must state that he or she knows of no impediment to the marriage and must say to the other: "I call upon these persons here present to witness that I, A.B., do take thee, C.D., to be my lawful wedded wife [or husband]," or "I, A.B., do take thee, C.D., to be my wedded wife [or husband]."

Marriage at Registrar's Office

Marriage may also take place at the office of the superintendent registrar on a superintendent registrar's certificate or certificate with licence. Two witnesses and open doors are required, the same words as those necessary at a marriage in a nonconformist church are used, and the ceremony must take place between 8 a.m. and 6 p.m. No religious service may take place at the superintendent registrar's office, but the minister of a nonconformist church or other religious body to which the parties belong may, if it is so desired, later celebrate a marriage service at his church. Such a service, however, is not a necessary part of a civil marriage ceremony.

During the Second Great War, some of the above rules as to notice and place were relaxed for the benefit of members of the armed forces who were frequently moved at short notice from one part of the country to another.

Where a person is under 21 and is not a widow or widower, the consent of the parents or guardian

is required to the marriage. If such consent is refused an application for consent can be made to the court, usually the magistrate's court. Failure to obtain consent of parents, guardian, or magistrate may make the parties liable to prosecution, but does not invalidate the marriage.

Where one of the parties is a Friend or where both are of Jewish faith the marriage may be solemnised according to the rites of these bodies on a superintendent registrar's certificate with or without a licence. The rules of English law as to open doors, the presence of witnesses, and the permitted hours do not apply.

Scotland and the U.S.A.

In Scotland marriages are either regular or irregular, *i.e.* by continued cohabitation, habit, and repute. The form of irregular runaway marriage by mere declaration at Gretna Green or elsewhere in Scotland (formerly valid) was abolished in 1940 by an Act of 1939. A regular marriage is celebrated by a minister after banns or publication of a notice at the registrar's; or, after notice, before a registrar; or on a sheriff's licence. Consent of parents is not required; but the marriage is void if either party is under 16.

U.S.A. Marriage laws in the U.S.A. differ from state to state. The age for marriage with consent of parents or guardian ranges from 14 for males and 12 for females in Idaho, Maine, Michigan, Mississippi, and New Jersey, in which states common law prevails, to 18 for males and females in West Virginia; age without consent varies from 18 to 21 for men and for women. Blood tests for the male only are required in Alabama, Louisiana, and Texas, for both parties in California, New York, Pennsylvania, Virginia, and 28 other states. There is no period of waiting before or after the issue of a licence in most states; five days is the longest term of waiting imposed. Common law marriages, without licence or ceremony, if they have lasted a year or more, are validated in most states. In the South, and some of the other states, marriage between whites and negroes is unlawful; and in some marriage between whites and Indians. *See* Divorce.

Married Woman's Property Acts. English laws for the protection of married women, which began with the Married Woman's Property Act of 1882. By common law a husband on marriage before that date became entitled to all the

personal property which the wife then had or later acquired, and had also extensive rights over her other property. His rights extended even to her earnings. Apart from a few exceptional cases, a married woman could not validly enter into any contract. The ingenuity of conveyancers had done something to mitigate the hardship of the rules relating to property, but this Act, which came into force on Jan. 1, 1883, stated that a woman married after that date should be entitled to hold as her separate property any real or personal property. She was also given the power to make contracts. In 1935 it was provided that a married woman should hold property in the same manner as an unmarried woman, and restrictions on anticipation were abolished in 1935 and 1949. The Act of 1882 left a husband liable for his wife's ante-nuptial debts to the extent of any property he acquired through her, and also for any tort committed by her; these liabilities were not removed until 1935.

Marriott, Sir John Arthur Ransome (1859-1945). British historian. From Repton he went



Sir John Marriott,
British historian

to New College, Oxford, where he was appointed to a lectureship in 1884. Secretary of the university extension delegacy, 1895-1920, he became a fellow of Worcester College in 1914. He was Conservative M.P. for Oxford City, 1917-22, and for York, 1923-29, serving on several financial committees. His special studies were the Eastern question in modern diplomacy, 19th cent. European history, and the growth of the British Empire. His publications include *The Mechanism of the Modern State*, 1927; *A History of Europe from 1815 to 1923*, 1931; *Commonwealth or Anarchy*, 1937; *The Evolution of the British Empire*, 1939; *Anglo-Russian Relations*, 1944. Marriott died June 6, 1945, and his *Memoirs of Four-score Years* appeared in 1948.

Marrow. Soft tissue found in bone. Red marrow occupies that part of the bone which is made up of spongy tissue. It is very vascular, and contains certain cells, known as erythroblasts, from which the red corpuscles of the blood are developed. Yellow marrow consists chiefly of fat cells, and

fills the medullary cavity in the centre of the shaft of long bones.

Marrow. Plant of the family Cucurbitaceae, better known as Vegetable Marrow (*q.v.*).

Marrow Controversy. Dispute in the Church of Scotland. Arising in 1718, it led finally to the formation of the Secession Church. It was named after *The Marrow of Modern Divinity*, 1644, by Edward Fisher, an English Calvinist, and was caused by the republication of this work in 1718, with a commendatory preface, by the Rev. James Hog of Carnock, the book being attacked and condemned as antinomian. *See* Presbyterianism; Church of Scotland.

Marrucini. Tribe of ancient Italy. They lived on the E. coast and came into notice in 315 B.C. as a member of an alliance formed to fight against the Romans. They then became allies of Rome, but soon disappeared from history.

Marryat, Frederick (1792-1848). British novelist and sailor. Born at Westminster, July 10, 1792, he was the son of Joseph Marryat, who had interests in the W. Indies. In 1806 he entered the navy and was at first under Lord Cochrane, afterwards earl of Dundonald, who appears in *Peter Simple* as Captain Savage. He saw service in European and American waters, before the peace of 1815. He held a command during the Burmese War of 1824-25, and retired in 1830. Made F.R.S. for his work in improving signalling, he is credited with several rescues of life. He died at Langham, Norfolk, Aug. 9, 1848.

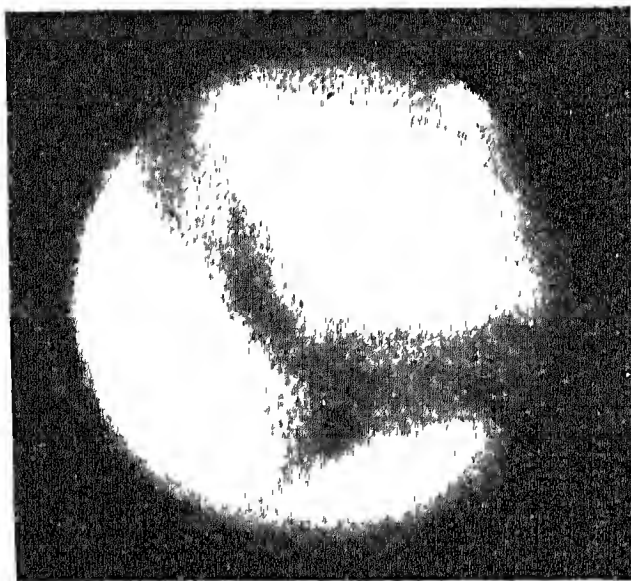


Captain Marryat,
British novelist

Marryat turned his experiences to good account in his numerous stories of nautical life. He began with *Frank Mildmay*, 1829; and went on with *Newton Forster*, 1832; *Peter Simple*, 1834; *Jacob Faithful*, 1834; *Mr. Midshipman Easy*, 1836; and *Snarley Yow, or The Dog Fiend*, 1837. Some of these attained remarkable popularity, especially among boys. Several appeared first in *The Metropolitan Magazine*, which Marryat edited 1832-35. His later books include *Masterman Ready*, 1841; *The Settlers in Canada*, 1844; and *The Children of the New Forest*, 1847. His daughter Florence (1838-99), herself author of some 70 novels, published his *Life and Letters*, 1872.

Mars. In classical mythology, the Italian god of war and agriculture, whom the Romans subsequently identified with the Greek *Arēs*. He was extensively worshipped by the Romans, who claimed him as the father of their founder Romulus. He was the god of the year, March being his special month. The Campus Martius or field of Mars, where stood an altar to the god, was the recognized place of exercise for the youth of Rome. He was also known as *Gradivus* and *Quirinus*. *See* *Arēs*.

Mars. First of the superior planets. Its mean distance from the sun is 141,710,000 m., and its



Mars. Telescopic photograph of the planet taken at the Mount Wilson Observatory, Pasadena, California

orbit is extremely eccentric. The mean diameter of the planet is 4,213 m.; its year 1.88 of our years, or 687 days; and the Martian day 24 hours, 37 mins., 23 secs. The mass of Mars is little more than one-tenth that of the earth (0.108), and its mean density as compared with the earth is 0.70. The tilt of Mars, or the angle between the plane of the planet's equator and the plane of its orbit, is 25° 12', and it has an analogous division of seasons to the earth's, though they are longer. Mars has two moons, *Deimos* and *Phobos*, the discovery of which in 1877 was predicted by Swift in *Gulliver's Travels*. They are very small, *Phobos* perhaps 10 m. in diameter, *Deimos* 5, and they revolve about Mars in 7 hours, 39 mins., and in 30 hours, 18 mins. respectively.

The determination of the elements relating to the orbit and mass of the Martian system has been exact enough to leave few loopholes for inquiry, but speculation has been busy about the constitution of Mars. Its ruddy colour, which fades to yellow and reddish brown in the telescope, was formerly thought to be due to the great density of its atmosphere, but is now believed to be due to oxidation of the surface rocks.

Modern observation and mathematical theory show that the planet's atmosphere is in quantity much less than that of the earth. It has clouds, which, according to observations by Pickering at the opposition of 1916, always lie over the so-called desert regions. Their existence was first noted by Lockyer in 1862, but for many years this was denied on the ground that there was no proof of the existence of water vapour on Mars. The spectroscope shows that the amount of water vapour to be found is not 1 p.c. of that on the earth.

In 1877 Schiaparelli discovered what he called channels, but described more usually by others as canals, extending from the darker patches on Mars over the lighter ones. This discovery gave rise to the conjecture that these channels were actual irrigation canals, by which the melting of the polar snows on Mars, of which there is visual evidence, might be made available for watering the desert regions.

This theory was supported by Lowell, whose drawings show the planet covered with a complex geometrical network of canals, meeting at so-called oases. Other equally good observers have failed to see the canals, and it is generally believed that, though much fine detail exists, the appearance of geometrical precision is suggested by factors that are subjective. Photography cannot yet decide the point, for even with the biggest telescopes exposure times running into seconds have to be used, during which atmospheric tremor can obliterate fine detail even in good observing conditions. Possibly some low form of vegetation could live in the dry atmosphere and cold nights (−110° F.) of Mars, but the existence of animal life is dubious. *See* Astronomy; Lowell, P.; Planet; Solar System.

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Marsala. Wine produced in the neighbourhood of, and exported from, Marsala, Sicily. An old and flourishing industry is based on the product of extensive vineyards in W. Sicily. A white, sweet, strong wine, Marsala resembles Madeira, but has a distinctive, pleasing flavour and golden colour, with a high percentage (average 22) of alcohol.

Marsala. A seaport of Sicily, Italy, in the prov. of Trapani. The most westerly point, 19 m. by rly. S. of Trapani, it is the centre of a wine producing district, and exports quantities of Marsala wine. It is built on the site of the ancient Lilybaeum, a Carthaginian stronghold, which fell to Rome, 241 B.C. Garibaldi landed here from Genoa, May 11, 1860. During Allied operations in Sicily in the Second Great War troops of the U.S. 7th army took the town from the Italians on July 23, 1943. The civic museum was almost completely destroyed. Pop (1951) 73,633.

Marschall von Bieberstein, ADOLF HERMANN, BARON (1842-1912). German statesman. Born at Karlsruhe, Oct. 12, 1842, he became a lawyer and was public prosecutor at Mannheim, 1865-75. Then he was elected to the Baden chamber of deputies, becoming a member of the Reichstag in 1878. On forming his cabinet in 1890 Caprivi made Marschall secretary for foreign affairs, in which capacity he exercised skill in dealing with the Kaiser's interference in state affairs. In 1897 he was appointed ambassador to Constantinople, and largely owing to the influence he acquired over Abdul Hamid Germany gained prestige in Turkey and the concession to build the Bagdad rly. Marschall died at Badenweiler, Sept. 24.

Marschner, HEINRICH AUGUST (1795-1861). German conductor and composer. Born at Zittau, Aug. 16, 1795, he studied law, but having a gift for music, soon turned to it professionally. He became acquainted with Beethoven, at whose suggestion he wrote his first opera. In 1823 he became a conductor at Dresden, and later was director of music there, and at Leipzig and Hanover, where he died Dec. 14, 1861. Marschner's greatest opera is *Hans Heiling*.

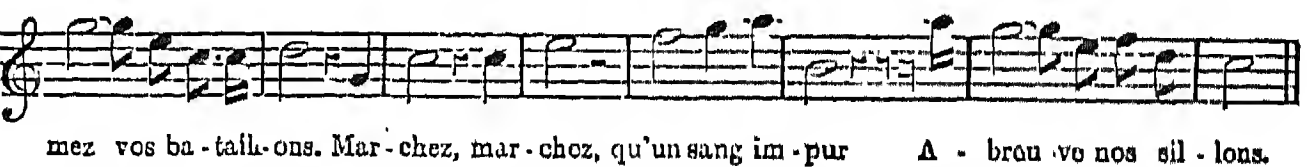
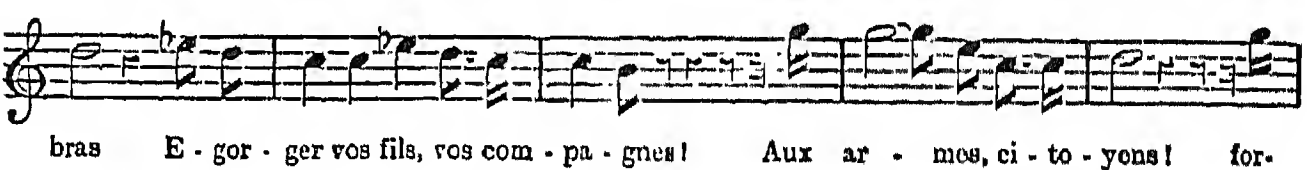
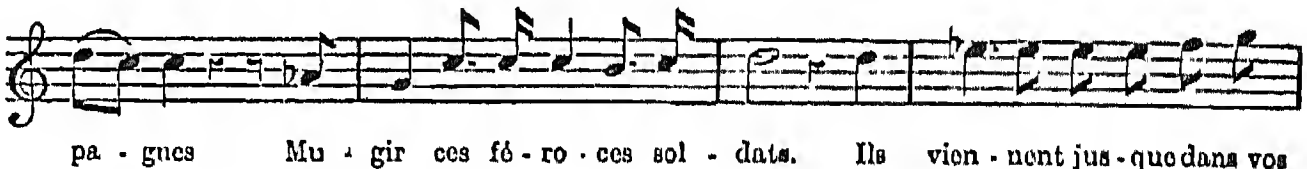
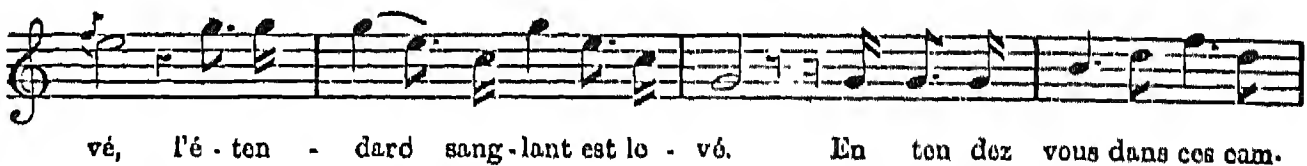
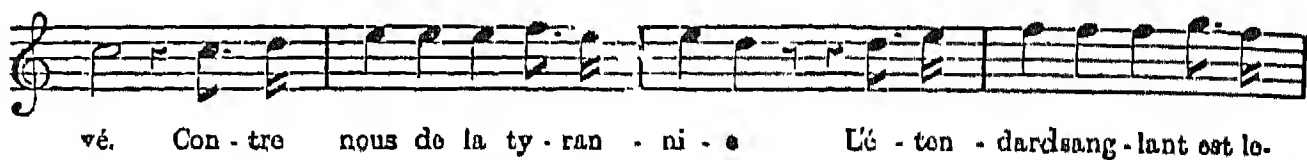
Marsden Square. Term applied to a map-making system devised by Marsden in 1831. A Mercator chart of the world is proportioned into squares of 10° latitude by 10° longitude, and numbered accordingly. Each area is further subdivided into 100 smaller squares 1° by 1°. The latter are allotted numbers from 00 to 99, so that the first figure, in conjunction with the main square, represents latitude and the second longitude. This system is used in charting meteorological data over ocean areas.

Marseillaise, LA. The national hymn of France since the period of the Revolution. It was written in

1792 at Strasbourg by a young officer of engineers, C. J. Rouget de Lisle, and received its name after having been sung by a party of revolutionaries from Marseilles on their entry into Paris, and again during the attack on the Tuileries. It was prohibited under the Bourbon and Bonaparte régimes, owing to its inflammatory effect on the people, who had adopted it as their rallying cry. The original version, in which the source of several modern variants can be traced, ran thus:

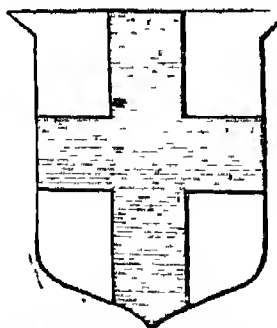
LA MARSEILLAISE

Rouget de Lisle



La Marseillaise. Original version of the French national hymn, reproduced from an old score. It varies slightly from the version now in use

Marseilles (Fr. Marseille). The second city and greatest seaport of France, and also of the whole Mediterranean. Capital of the dept. Bouches-du-Rhône, Marseilles is situated on the most favoured spot of the Mediterranean coast, in a huge bay surrounded by hills and protected by a range of small, rocky islands. Far enough from the delta of the Rhône river not to have its basins silted up, near enough to exploit the natural trading road of the Rhône valley, Marseilles covers a huge territory—larger than the area of Paris—along the coast. It was one of the world's most picturesque cities until, in January, 1943, its famous old port and the surrounding quarter—mostly huge,

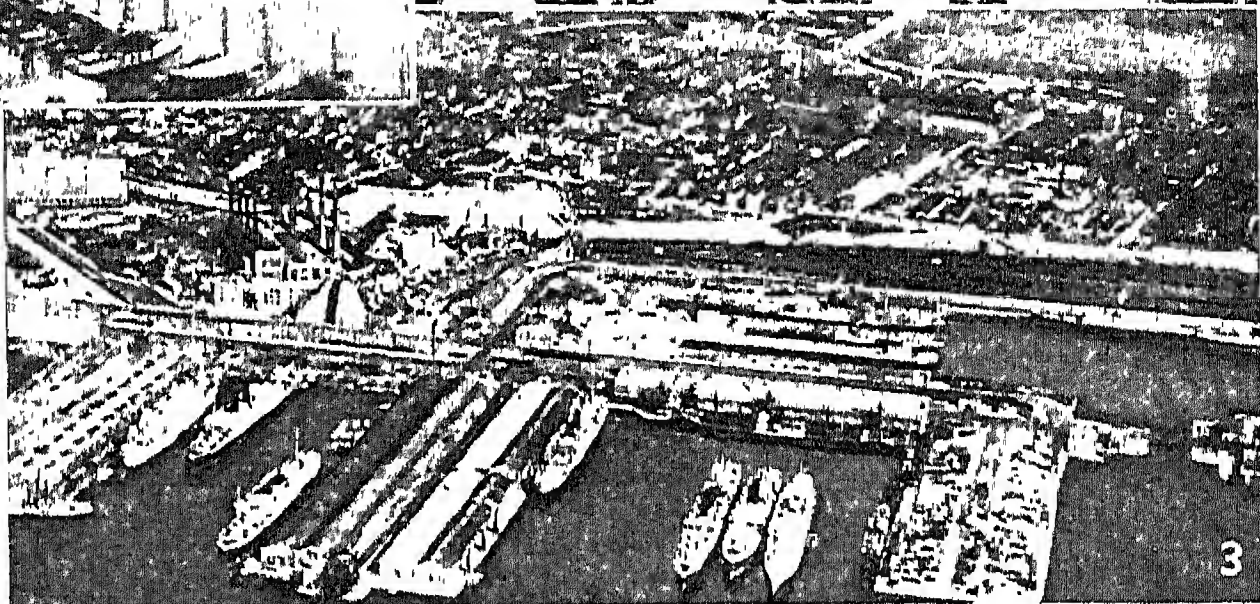
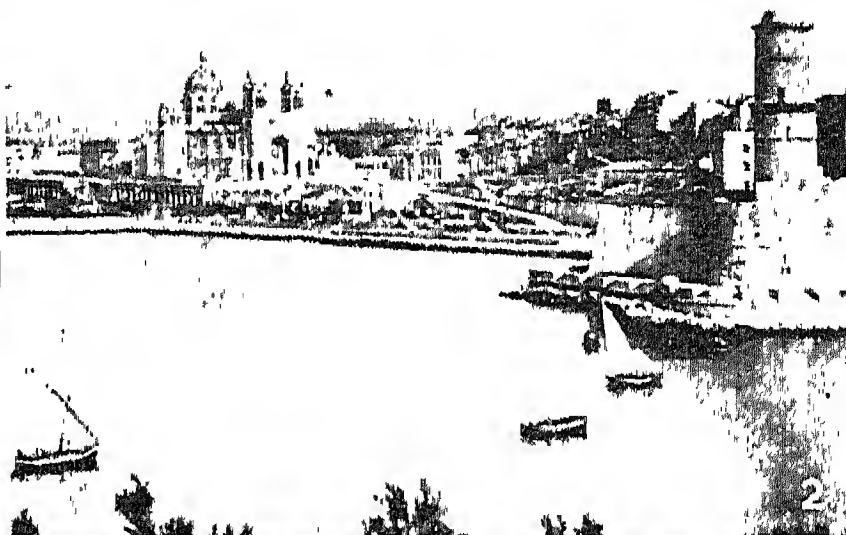


Marseilles arms

dreary buildings in narrow, dirty streets and blind alleys—were blown up or transformed into fortifications by the German invader. The old port had been a natural basin, $\frac{2}{3}$ of a mile long and 133 ft. wide, crossed by the *pont transbordeur*, a unique suspension-ferry with 285-ft.-high towers in steel framework, built 1905, destroyed by the Germans; this port, abandoned for nearly a century except for fishing vessels, was surrounded by restaurants where Marseilles's famous fish soup,

bouillabaisse, was the principal dish offered.

From the old port the principal street of Marseilles, the impressive Cannebière, started up a gentle slope. A few yards away were the slums, thieves' dens, and brothels of a big harbour town. Before the Second Great War, the population included 125,000 Italians, 22,000 Spaniards, 22,000 Armenians, Turks, Lebanese, Greeks, Russians, Swiss, and numerous coloured citizens of French colonies, all registered as French. Fully half the Marseilles population at that time hailed from other countries, a fact which contributed to its rapid growth (1801, 90,500; 1872, 313,000; 1926, 652,600; 1932, 803,230). The new port, begun in 1844, had 11 basins, one, Madrague, connected with the Marseilles-Rhône canal, and was used annually by 8,000-9,000 vessels of



a total tonnage of some 15 million tons: goods handled weighed 7-10 million tons.

Rlys., connected with the port partly by tunnels, linked France, Germany, Switzerland, etc., with Italy and Spain, a great airport for land- and seaplanes on the lake of Marignane, 12 m. N.W. of Marseilles, and a service of bus lines, especially along the Riviera coast, further enhanced the dominating position of the city. As a fortress, and the seat of the medical and science faculties of the Aix-Marseilles university, of legal, colonial, etc. schools, of an observatory, zoological and botanical gardens, libraries (one of which held 112,000 vols., 145 incunabulae, and 1,689 manuscripts), Marseilles plays a rôle in France's intellectual and public life; its industries, especially its famous soap, but also chemical, glass, ship-building, and engineering works, are important, though less so than its trade.

One of Europe's oldest cities, Marseilles is nevertheless essentially modern. Its most impressive buildings—the palais de Longchamp, containing several museums; the Byzantine cathedral near the old port; and the church of Notre Dame de la Garde, on a 300-

ft. hill, with a 150-ft. tower carrying a 30-ft. gilded statue of the Virgin visible from far out to sea—all date from the middle of the 19th cent. Among ancient buildings, the church of St. Victor, 10th to 13th, Notre Dame du Mont Carmel, 13th, the town hall, 17th, and the Grand Théâtre, 18th cent., are the most important. The beautiful promenade de la Corniche, along Marseilles's hilly promontory, the fashionable avenue du Prado and several boulevards, with their colourful life, are among the city's attractions. Pop. (1954) 661,492.

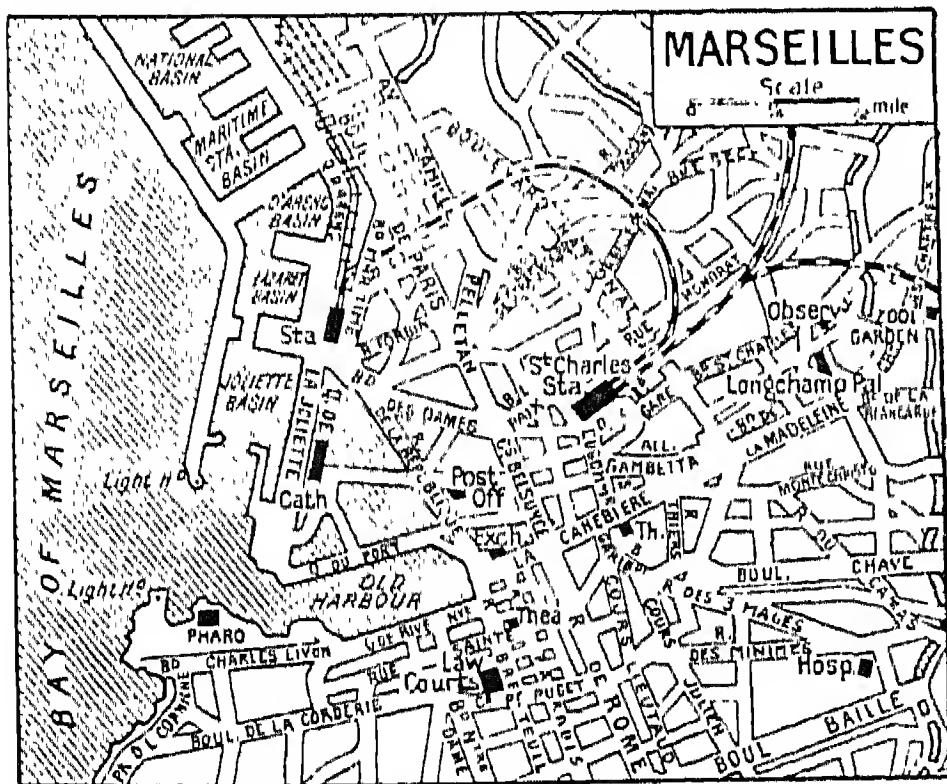
The history of Marseilles goes back to about 600 B.C. when Ionian Greeks settled here, calling it Massalia. It was an aristocratic republic, mother of such towns as Antibes.

Nice, Monaco, and Arles; later allied with Rome, it was annexed, 49 B.C., by Caesar, and called Massilia. Though long remaining a centre of Greek civilization, it was successively taken by Visigoths, Ostrogoths, and Franks between the 5th and the 9th cents., was attached to Lower

Burgundy—Arelat—in A.D. 879, and regained independence 1212-16. It fell to Charles of Anjou 1246, to France 1481, but refused recognition of the crown until 1596. Its last privileges were abolished by Louis XIV in 1660. During the French Revolution it sided with the Girondists against the Jacobite terror, but was subdued. It regained its importance in consequence of France's conquest of N. Africa and the opening of the Suez canal. Traces of its ancient history, from Phoenician, Egyptian, Greek, Roman, and its early Christian days—it was a bishopric from A.D. 420—to the Middle Ages, are carefully preserved in its archaeological museum.

During the Second Great War Marseilles lay in the unoccupied zone of France from June, 1940, to Nov., 1942, when that zone also was occupied by the Germans following the Allied landings in French North Africa. When the Allies landed in the south of France, Aug. 15, 1944, French forces under Gen. de Lattre de Tassigny advanced on Marseilles, which fell on Aug. 23, unorganized German resistance continuing, however, until the 28th. The city had not suffered seriously in the fighting.

Marseilles-Rhône Canal. An artificial waterway making navigation possible between Geneva and Lyons and the Mediterranean Sea, by means of a canalised Rhône and a canal to the harbour at Marseilles.



Marseilles. Plan of the old town and principal docks of the French Mediterranean port

Its two main features are a lock at Génissiat near the Swiss frontier and the use of a specially constructed tunnel near Marseilles. The tunnel is $4\frac{1}{2}$ m. long, 72 ft. wide, with a depth of 10 ft. of water, contains two waterways, and was cut 1911-16; the canal between the river and Marseilles, which was opened to shipping in 1926, is 48 m. in length.

Marshal (old High Ger. *mara*, war horse; *scal*, servant). Title of various high military and civil officers. Originally meaning a groom or farrier, it was applied to the Frankish master of the horse. In England and Scotland the marshal had important duties and became a great officer of state. In France the marshal, associated with the constable, originally had high military command, and the office was revived temporarily by Napoleon. The title of marshal of France, which had been in abeyance since 1871, was revived in 1916, when it was bestowed on Joffre, and later on Foch, Pétain, Lyautey, and others. Marshal is a high military title in the U.S.S.R.

The term was also used for a kind of guardian of etiquette; in the British royal household there is an official in the lord chamberlain's department called the marshal of the ceremonies. The marshal of the king's bench was judge of the Marshalsea court, which tried disputes between royal servants. The city marshal, an officer of the corporation of London, rides before the lord mayor. At Oxford university the marshal is the proctor's chief attendant, and at Cambridge the vice-chancellor has two marshals. A judge of the high court when on circuit

is accompanied by a marshal, usually a young barrister, who acts as his secretary. His duties included the swearing in of the grand jury until these juries were abolished by the Administration of Justice Act, 1933. See Air Marshal; Earl Marshal; Field-marshal; Marischal; Marshal of the R.A.F.

Marshall, ALFRED (1842-1924). British economist. Born July 26, 1842, he was educated at Merchant Taylors' and St. John's College, Cambridge. In 1865 he was second wrangler, and he became a fellow of St. John's. In 1877 he was made principal of University College, Bristol, and in 1883 fellow and lecturer of Balliol College, Oxford. He was at Cambridge from 1885 to 1908 as professor of political economy, on which subject he had made himself a foremost authority, adapting the ideas of Ricardo and Mill to altered conditions. His classic work is *Principles of Economics*, 1890; he wrote *Industry and Trade*, 1919. Died July 13, 1924.



Alfred Marshall,
British economist

Marshall, GEORGE CATLETT (b. 1880). U.S. soldier and administrator. Born at Uniontown, Pennsylvania, on Dec. 31, 1880, he was educated at Virginia military institute, Lexington, being commissioned in the infantry Feb. 2, 1901. He served with the American expeditionary force in France in 1917, was A.D.C. to Gen. Pershing, 1919-24, and served in China, 1924-27. Back in the U.S.A., he held various posts, then in 1938 was made chief

of the war plans dept. of the general staff, becoming chief of staff with promotion to general, Sept. 1, 1939, the day Germany invaded Poland.

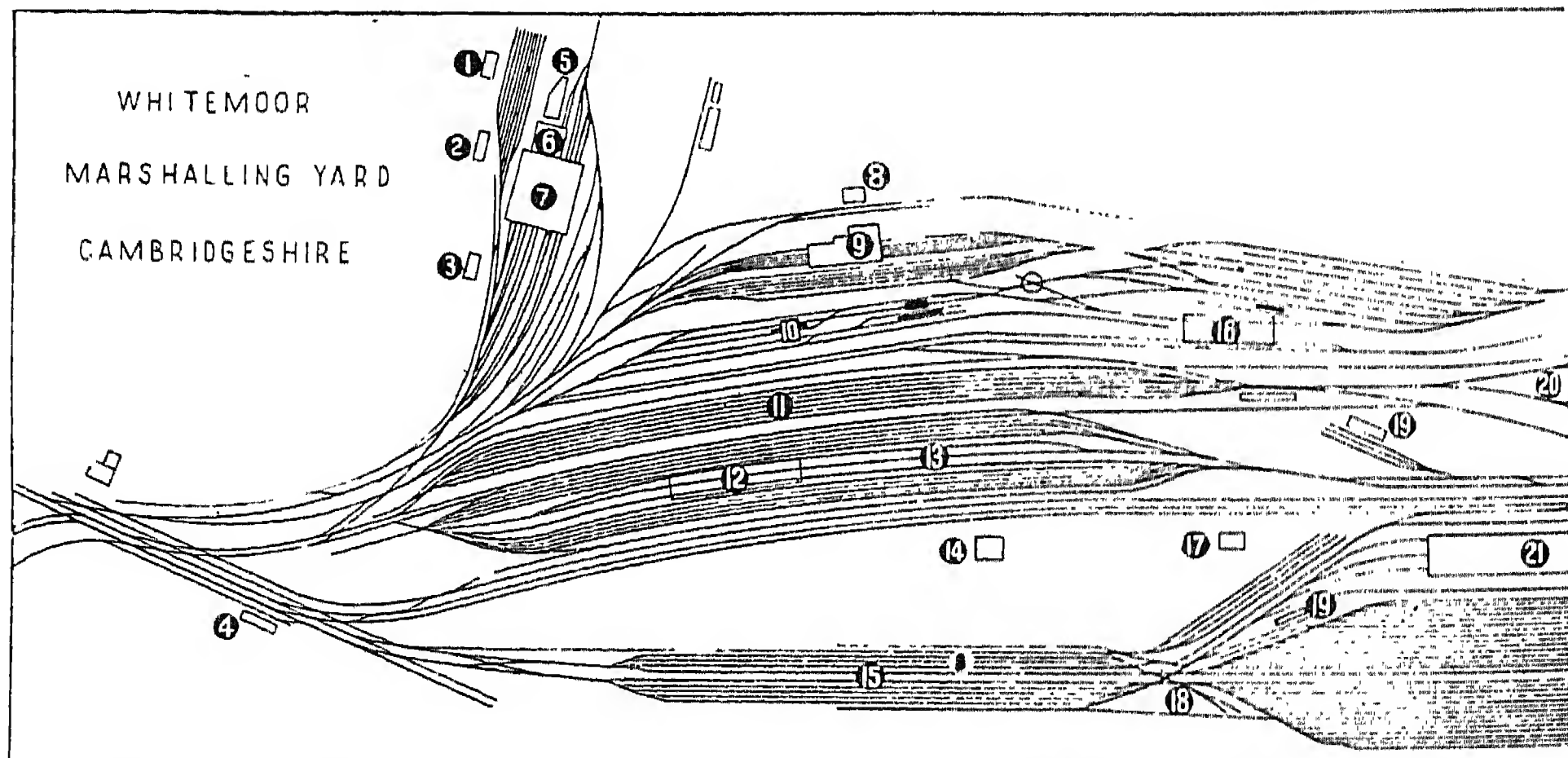
An advocate of conscription, he directed and coordinated with admirable tact and efficiency the expansion of the U.S. army after



George C. Marshall,
U.S. soldier and
administrator

enactment of the Selective Service bill. When the U.S.A. found herself in the Second Great War on Dec. 7, 1941, the army consisted of 1,500,000 men; by July, 1944, it had grown to 7,700,000, with more than 4,000,000 serving overseas in Europe, the Pacific, and Asia. It was Marshall who chose Eisenhower to command the Allied armies for the invasion of Europe on June 6, 1944. With Roosevelt, Marshall attended the conferences at Casablanca, Quebec, Cairo, and Teheran in 1943, at Quebec in 1944, and at Yalta in the Crimea, 1945. He was one of four made general of the army when that rank was created in Dec., 1944.

After the war he advocated a strong citizen army, and unification of the armed forces; but he relinquished his post as chief of staff on Nov. 20 before bringing any of these ideas to fruition, in order to become ambassador to China in an attempt to bring peace to that divided land. After 13 months, back in Washington he blamed extremists of both the Communists and Chiang Kai-shek's govt. for the failure of his



Marshalling yard. Whitemoor marshalling yard (formerly L.N.E.R.), Cambridgeshire. Incoming trains are split up by

mission. On Jan. 8, 1947, he succeeded James Byrnes as secretary of state, dropping his military title. He attended the abortive meetings of the council of foreign ministers in Moscow, March 10–April 24, and London, Nov. 25–Dec. 15. Speaking at Harvard university on June 5, he developed suggestions already made by Dean Acheson (*q.v.*), whereby all Europe, acting in concert, might be helped by American aid to economic recovery. (See European Recovery Programme.) He resigned 1949, becoming sec. of defence 1950–51. In 1953 he was awarded the Nobel Peace prize.

Marshall, JOHN (1755–1835). American lawyer. Born in Virginia, Sept. 24, 1755, he fought through the War of Independence. Admitted to the bar in 1781 and 1782 elected member of the Virginia legislature, in 1798 he was elected to congress. In 1801 he became chief justice of the supreme court, and his judgements have become classics in American jurisprudence. He died July 6, 1835. A study by Lord Craigmyle appeared in 1933.

Marshall Hall, SIR EDWARD (1858–1927). British lawyer. Born at Brighton, Sept. 16, 1858, and educated at Rugby and St. John's College, Cambridge, he became a barrister in 1888, and began to practise on the south-eastern circuit. He made a particular reputation in criminal cases, and from about 1900 he was the foremost advocate of this kind at the bar, appearing in outstanding trials, such as those of G. J. Smith, Seddon, Thompson and Bywaters. In 1898 he took silk, and in 1917 he was knighted. In 1900 Marshall Hall entered parliament as Union-

ist M.P. for Southport. He lost his seat in 1906, but in 1910 found one at East Toxteth, which he retained until 1916. Died Feb. 24, 1927. *Consult* Life, E. Marshallbanks, 1929.

Marshalling. In heraldry, the art of grouping and blending insignia so as to form an heraldic record. Thus a man who marries an heiress, or who acquires, or claims the rights to, territorial possession or hereditary offices, places the arms of his wife, the arms or other insignia of the feudal estate, territory, or office, in a small shield, called a shield of pretence, or a surtout, in the middle of his own arms. His successors usually quarter the arms of the heiress with their own, according to modern practice placing the paternal arms in the first and fourth quarters, and that of the heiress in the second and third. But in medieval days those who acquired a fief or feudal estate superior to their own either abandoned their paternal arms for the more valuable insignia, or gave the latter precedence.

With sovereign territorial rights, or the acquisition of hereditary offices, the successors might retain the insignia in the shield of pretence, or quarter them. A husband and the holder of certain important offices, such as a bishop or a herald, impales his paternal arms with those of his wife or his office; in the former case placing his on the dexter, and in the latter on the



Sir E. Marshall Hall,
British lawyer

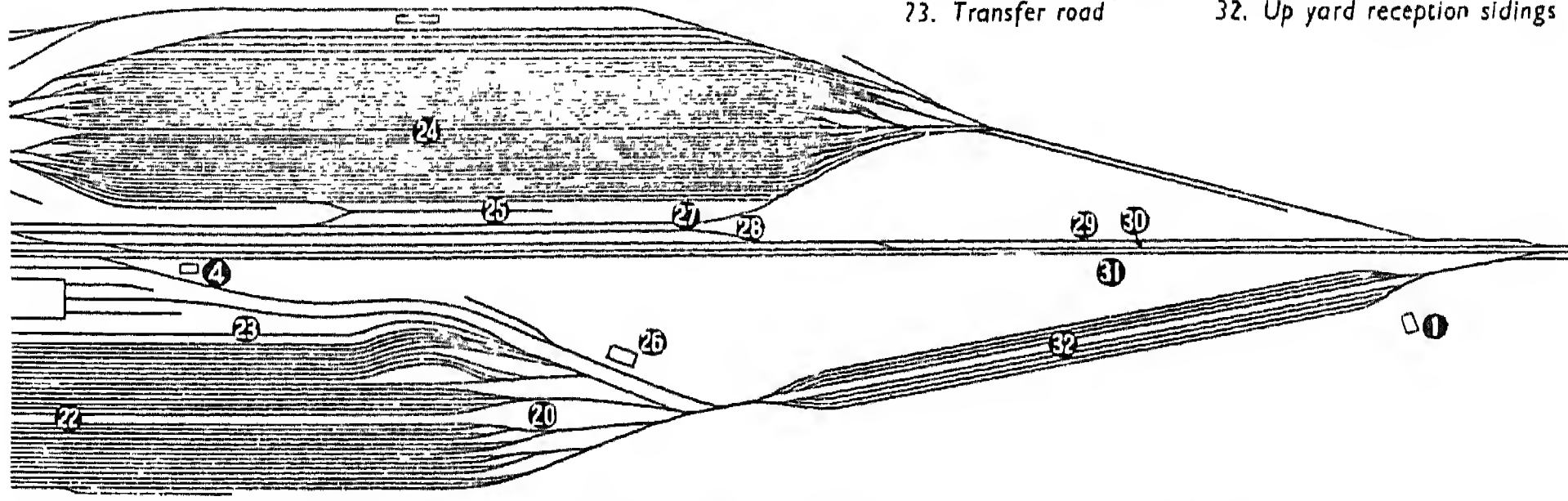
sinister, side of the shield. Or the two coats of arms may be retained in separate shields, which are placed together. See Heraldry.

Marshalling. Term used in the law of equity. A testator leaves two funds from which claims on his estate can be paid. Marshalling the assets means arranging them so that a person who has the right to have his legacy or debt discharged from both funds shall not do so to the detriment of another who can only come upon one fund. Thus A, who is entitled to receive £1,000 from either fund, cannot have it all out of fund A, which totals only £1,000 in all, as in that case he will be depriving of his rights B, whose £500 is payable only from this fund.

Marshalling Yard. Network of rails spreading out fanwise from a central track to enable trains of loaded freight wagons coming from different directions to be split up and formed into trains which will distribute them to their final destination. Stated simply, a marshalling yard accepts wagons from N., S., E., and W., and sorts them so that all wagons going S. form one train, and so on.

In a flat marshalling yard, the incoming wagons enter direct upon one of the sidings, where a shunting engine pushes them in "cuts" of one or more wagons according to their destination, into the lines upon which trains are being made up. Where large numbers of wagons have to be sorted and made up into trains, the hump system is employed. The wagons of each incoming train are uncoupled according to destination and then pushed slowly over an artificial hump, on the far side of

- | | | | |
|------------------------|----------------------------|------------------------------|-------------------------------|
| 1. Reservoir | 8. Water cooling tank | 15. Up departure roads | 24. Down empty yard |
| 2. Stores | 9. New loco. running shed | 16. Loco. oil fuelling plant | 25. Exchange siding |
| 3. Offices | 10. Coaling plant | 17. Tank house | 26. Pump house |
| 4. Junction signal box | 11. Down reception sidings | 18. Brake hump | 27. Transfer road |
| 5. Sub-station | 12. Down tranship shed | 19. Cattle pens | 28. Departure road |
| 6. Blacksmith's shop | 13. Down goods yard | 20. Control tower | 29. Down reception road |
| 7. Loco-repair shed | 14. Yardmaster's office | 21. Up tranship shed | 30. Down main |
| | | 22. Up marshalling yard | 31. Up main |
| | | 23. Transfer road | 32. Up yard reception sidings |



running over the hump (18) on to the radiating tracks (22). Outgoing wagons are shunted on to other tracks (24)

which is a steep slope with sorting sidings radiating. As each wagon draws away from the rest of the train it drops down by gravity on to the sidings. Sufficient time is allowed for switches, giving access to the fan of sidings, to be moved between one wagon and the next, so that each may run into the appropriate track.

Train sorting in the largest marshalling yards is now completely mechanised. Before a train is pushed up the hump, the wagons are uncoupled and a list of their destinations compiled by the shunter and posted by pneumatic tube to a control tower. From these lists the entire movements necessary to make up a train are set on a control machine which automatically arranges the points leading to the final sorting track. As each wagon runs down the hump it trips a lever which automatically resets the points behind it. Points immediately beyond the track leading from the hump are operated electrically from the control tower. To prevent wagons running off the hump too rapidly, rail-brakes, controlled from the tower, are fitted in the tracks.

One of the largest marshalling yards in Great Britain working on the mechanised hump system is at Whitmoor, near March, Cambs. It has 40 sorting sidings radiating from the hump and can deal with over 4,000 wagons daily. Train movements are controlled by radio telephony. The most famous marshalling yard in Europe is at Hamm, Germany; this was repeatedly bombed by Allied aircraft during the Second Great War.

Marshall Islands. Two chains of islands in the N. Pacific ocean. They lie E. of the Carolines, and are composed of the Ratak group of 13 islands and the Ralik group of 11. They are shallow-soiled, but yield crops of coconuts and bread fruit. Phosphate and copra are exported. The chief island and administrative centre is Jaluit. They were occupied by German traders in 1888 and taken over by the German colonial authorities in 1906. Seized by the Japanese early in the First Great War, they were afterwards administered as a Japanese mandate. During the Second Great War the islands were frequently attacked by U.S. aircraft and by the U.S. Pacific Fleet.

On Jan. 29, 1944, after raids on 20 consecutive days, U.S. forces began a concentrated attack—the largest undertaken to that date—by carrier and shore-based planes and by bombardment from cruisers on the chief islands of the group. The small undefended atoll of Majuro was taken on Jan. 31, and next day U.S. marines landed on Roi, Namur, and Kwajalein. By Feb. 22 control of the Marshalls had passed to the U.S.A. The Japanese



garrisons of those atolls not invaded, left helpless by the Allied advance in the Pacific, surrendered formally Sept. 2, 1945.

The U.N. trusteeship of the group was given to the U.S.A. in 1947.

In the same year Eniwetok (*q.v.*) atoll was developed as a testing ground for atomic weapons.

Marshall Pass. Pass in Colorado, U.S.A., in Saguache co. It is named after William Louis Marshall, who served in the Civil War. It has an elevation of 10,841 ft., and is used as a rly. route across the Rocky mountains.

Marshall Plan. Name popularly given to proposals put forward by G. C. Marshall (*q.v.*), as U.S. secretary of state, in a speech at Harvard university on June 5, 1947, for economic cooperation

among European countries in their own post-war recovery, with assistance from the U.S.A. It led to the creation in 1948 of the highly beneficial European Recovery Programme (*q.v.*).

Marshal of the Royal Air Force. Highest rank in the R.A.F. corresponding to admiral of the fleet and field marshal. Until the outbreak of the Second Great War, it had been granted to only three officers, apart from the reigning sovereign, the first being Sir Hugh (later Viscount) Trenchard, in 1927. The insignia of rank are one broad and four narrow rings on the tunic sleeves or coat epaulettes.

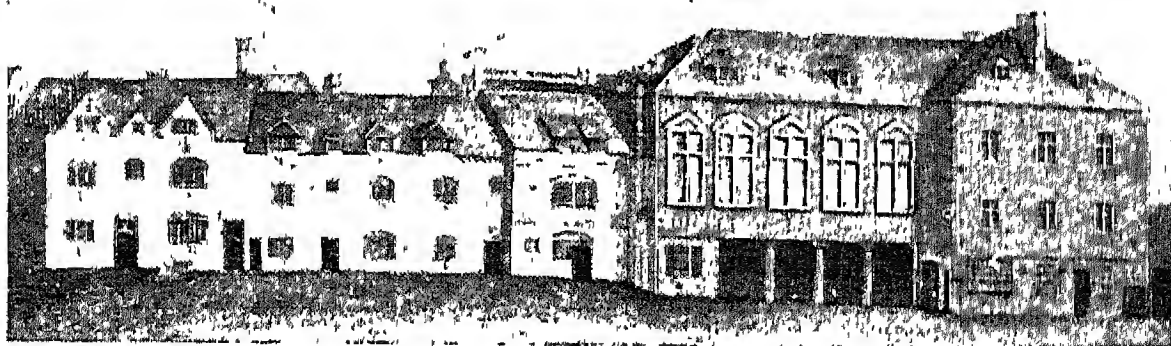
Marshalsea. Former London prison. Originally the prison of the court of the knights marshal for settlement of disputes among royal servants, and punishment of offenders within the jurisdiction of the king's court, it stood opposite Maypole Alley, in Borough High Street, Southwark. Mentioned in the 14th century, it suffered at the hands of the rebels under Wat Tyler. In Elizabethan times the second of the London prisons, it became in the 18th century the county gaol for felons, an admiralty gaol for pirates, and a debtors' prison. Notable prisoners included Bishop Bonner, who died here, George Wither, and John Udall.

In 1753 John Wesley described the original building (pulled down 1780) as a picture of hell upon earth. Rebuilt 1811, on ground adjoining S. George's Churchyard, this structure was the one made famous by Dickens in *Little Dorrit*, and the one in which his father was imprisoned. It remained in use until the court was abolished in 1849, and was demolished in 1887, with the exception of a turret. See illus. below.

Marsh Cypress (*Taxodium distichum*). Tall coniferous tree of the family Pinaceae. A native of N. America, it is also known as the bald or black cypress. The leaves are very slender and yew-like, and are shed in autumn; the cones globular, of thick, shield-shaped scales. It grows in swamps, and, like the white mangrove (*q.v.*), its roots send up "knee-roots" for the purpose of supplying the roots with oxygen. In the marsh cypress these growths, which are hollow, may be more than 3 ft. in height. Correlated with these "knee-roots," the base



Marshall Islands.
Types of natives



Marshalsea. Part of the north side of the old London prison. Left, buildings of the original prison; right, the court house, which was a later addition. From a print of 1773

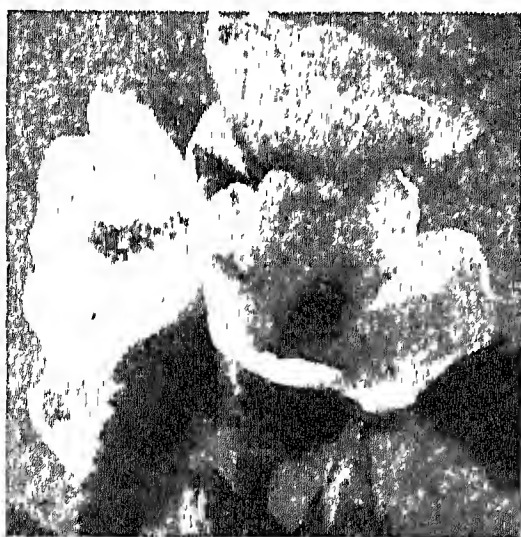


Marsh Cypress, showing the knee-roots sent up to obtain oxygen

of the trunk has a hollow space, into which the oxygen is conducted.

Marsh Gas. Alternative name for fire-damp, methyl hydride, or methane (*q.v.*).

Marsh Mallow (*Althaea officinalis*). Perennial herb of the family Malvaceae. Indigenous to Europe, Asia, and N. Africa, it has roundish or oval thick leaves with toothed edges, and large rosy flowers. The whole plant is downy. It grows in marshes near the sea. The hollyhock (*A. rosea*) is a Chinese species of the genus.



Marsh Mallow. A plant that thrives near the sea

Marsh Marigold (*Caltha palustris*). Perennial herb of the family Ranunculaceae.

A native of Europe, Asia, and N. America, it is also known as kingcup. It has a stout, creeping rootstock, and large, kidney-shaped leaves. The flowers are exaggerated buttercups of golden yellow sepals, the petals being absent. The unopened buds are pickled and eaten as a substitute for capers. See Botany.



Marsh Marigold or Kingcup. Flowers and leaves

These hardy mountaineers came over the Alpine passes, and absorbed the primitive aboriginal

hunters of Mediterranean stock. They shared in the Social or Marsic War (90-88 B.C.), which gained for them and other provincial tribes the Roman franchise. See Paeligni.

Marsileaceae. A family of Pteridophytes (fern-plants) containing the genera *Marsilea* and *Pilularia*. They are marsh or aquatic plants, and have creeping rootstocks, sending up fronds at intervals. These are rolled from the top, as in the true ferns. The spore-capsules spring from the base of the frond. The development of the spore into a spore-bearing plant is somewhat similar to that in other Pteridophytes. See Pillwort.

Mars-la-Tour. A village of France, in the dept. of Meurthe-et-Moselle, 9 m. W. of Metz. It was the scene on Aug. 16, 1870, of a severe cavalry fight in the Franco-Prussian War. The 2nd Dragoons of the Prussian Guard were sent in to rescue the 38th (Westphalian) infantry brigade from General de Ladmirault's men. Ladmirault sent six regiments of horse to attack them, but these were again met by von Barby's cavalry brigade, and a great hand-to-hand struggle terminated in favour of the Prussians.

Marsovan, MERZIVAN, OR MERSIVUN. Town of Asiatic Turkey, in the vilayet of Amasya. It is 24 m. W.N.W. of the town of Amasya, on the edge of Marsovan Plain. Silver is mined in the locality.

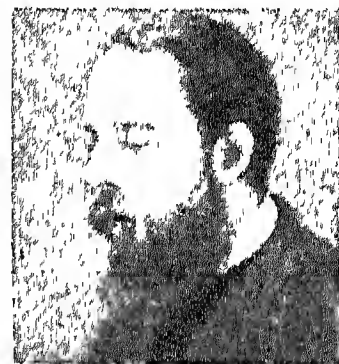
Marston, JOHN (c. 1575-1634). English dramatist. His father was English and his mother Italian. Educated at Coventry and at Brasenose College, Oxford, he wrote a number of satires, several tragedies and comedies, and became involved in the famous stage quarrel with Jonson and Dekker. Marston's first work, an amatory poem, *The Metamorphosis of Pigmalion's Image*, and his series of satires, *The Scourge of Villanie*, both published 1598, were burnt by order of Archbishop Whitgift. His earlier dramatic work, particularly the tragedies *Antonio and Mellida*, *Antonio's Revenge*, and *Sophonisba*, are vigorous but turgid and unreal. Marston collaborated with Jonson and Chapman in *Eastward Hoe*! His plays were edited by A. H. Bullen in 1887.

Marston, JOHN WESTLAND (1819-90). British dramatist and critic. Born at Boston, Lincolnshire, Jan. 30, 1819, he early gave up the law for literature, and wrote about a dozen plays, chiefly poetical dramas, of which the most successful were *The Patrician's Daughter*, 1841, *Strathmore*, Philip of France, and, in prose, *A Hard Struggle*. He died Jan. 5, 1890.



Westland Marston, British dramatist After E. Morn

Marston, PHILIP BOURKE (1850-87). British poet. He was born in London, a son of John Westland Marston (*v.s.*), Aug. 13, 1850, and became almost blind at the age of three; lost by death within a few years his fiancée, his two sisters, and his friends Oliver Madox Brown and James Thomson. His poems, often exquisite if somewhat monotonous, were pub. as *Song Tide*, *All in All*, *Wind Voices*. He died Feb. 13, 1887.



Philip B. Marston, British poet

Marston Moor, BATTLE OF. Fought July 2, 1644, during the English Civil War (*q.v.*). The Scottish army, as promised in the Solemn League and Covenant, had entered England and united with the parliamentary force in the north. In the face of this menace Newcastle, the king's general, fell back on York, and that city was besieged. A royalist force under Rupert was sent to its relief. Rupert's army crossed into Yorkshire on June 28.

The Scots and their allies awaited the enemy on Marston Moor, between York and Knaresborough. Rupert, however, avoided them, and, entering York, urged Newcastle to fight. The parliamentarians were already in retreat, but when pursued they turned and stood on this moor, between Longmarston and Tockwith. The parliamentary army had infantry, Scots and English, in the centre, and cavalry on the wings. Cromwell with his Ironsides and David Leslie with some Scottish horse were on the left. The royalists were in similar formation. The royalists, not expecting the action until the morrow, were hardly

ready for the opening of the battle, when the parliamentarians, at 7 p.m. on July 2, attacked in full force.

On the left, Cromwell and Leslie drove Rupert's horsemen from the field, but on the right Fairfax was routed, and in the centre the royalists also had the advantage. A breach was made in the parliamentary line and many were soon in flight. But Cromwell, keeping his men well in hand, swung them round and fell upon the victorious royalist horsemen of the other wing, who were quickly routed. The infantry of the eastern counties, who had stood firm, did their part, and soon a great attack was delivered on the unbroken line of the royalist foot. These fought valiantly, but by the end of the day all were either dead, prisoners, or fugitives. The victors at once entered York. It is computed that the parliamentarians numbered about 25,000 and the royalists about 18,000. Of the latter about 3,000 were slain.

Marsupial (Lat. *marsupium*, a pouch). Sub-class of mammals. They are provided with pouches in which the later stages of the development of the young take place. Except for the monotremes (*q.v.*) they form the most primitive living group of mammals, and are distinguished by the details of their embryology. The young are born after a very short gestation, in a very small and rudimentary condition.

The young of the kangaroo, for example, is only about an inch long at birth. The mother takes up the newly-born young, apparently with her lips, and places them in the abdominal pouch, which contains the teats. Here they are attached to the teats by their lips, which at this stage resemble a



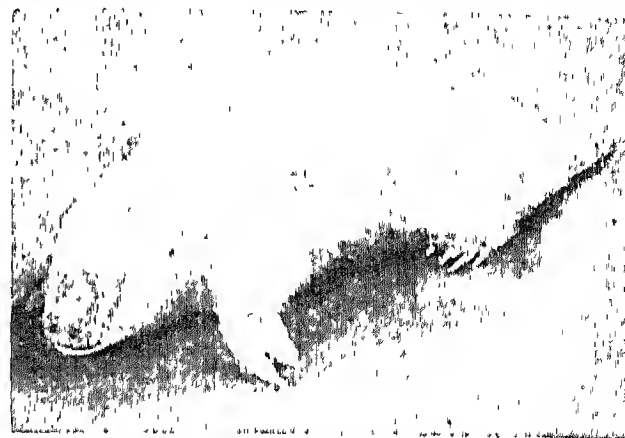
Marsupial. Bennett's Wallaby, a typical marsupial carrying her young in the pouch characteristic of the order
Gambiri Bolton, F.Z.S.

cylindrical sucker, and the milk is injected into their throats by muscular contractions on the part of the mother. To avoid the danger of choking, the upper portion of the windpipe in the young is at this stage prolonged into a tube which fits into the back of the nasal cavity, so that air is drawn directly from the nostrils into the lungs, while the milk passes outside and around this tube into the gullet, and so to the stomach. In a very few species the pouch is absent, the young being concealed by the long hair as they cling to the teats.

Marsupials are found both in Australasia and S. America. These regions are characterised by their isolation and the comparative absence of animals of the placental type. The marsupials would probably have become extinct if it were not for this fact, for they cannot compete with the placental mammals. Formerly their range was much wider, occurring in most parts of Europe; and fossil remains have been found in Great Britain. The earliest known fossils occur in the Cretaceous rocks of Canada, and are generally regarded as nearly, if not quite, the most primitive form of mammalian life.

The existing marsupials are divided into two sub-orders, chiefly differentiated by their dentition. The first are mainly carnivorous and the second mainly herbivorous, although insectivorous examples occur in both. The former includes the Tasmanian wolf, the dasyure or native cat of Australia, the bandicoots, the banded anteater, and American opossum. The herbivorous marsupials include the kangaroo and wallaby, the phalanger, the kangaroo rat, the wombat, and the koala or native bear. In size they vary from the grey kangaroo, which is often 5 ft. high, to species no larger than a mouse. See under names of marsupials quoted.

Marsupial Mole (*Notoryctes typhlops*). Small marsupial mammal, found in the deserts of S. Australia. It is molelike in general appearance and habits, is about 5 ins. long, and its soft fur is golden-red in colour. The forepaws are powerful digging implements, paddle-shaped, and armed with strong and stout claws. The abdomen is provided with a pouch in which the young are suckled. There are no external eyes or ears, and the animal seems to make its way about by its sense of touch. Also called the pouched mole, it is



Marsupial Mole. Specimen of the small Australian desert mammal

found a few inches below the surface of the sand.

Marsyas. In Greek mythology, a Phrygian peasant, or, according to other accounts, a satyr. Proud of his skill on the flute, he challenged Apollo to a contest. The contest took place on the understanding that the victor should do what he willed to the other. The Muses, who were the umpires, awarded the decision to Apollo, who punished Marsyas for his presumption by binding him to a tree and flaying him alive.

Martaban, GULF OF. Broad inlet of the Bay of Bengal in Burma. The Sittang flows into the head of the gulf; W. is the Irawadi delta, E. the mouth of the Salween. Rangoon, Moulmein, Pegu, and Amherst all lie on or close to the shore. The city of Martaban, which was for several centuries the capital of the kingdom of Pegu, is now only a village.

Martel, SIR GIFFARD LE QUESNE (b. 1889). British soldier. Martel was born Oct. 10, 1889, and educated at Wellington College. He served in France during the First Great War, and was an instructor at the staff college, Quetta, 1930-34. Martel became an authority on mechanisation and the employment of tanks, on which he contributes the article in this Encyclopedia - also those on British Expeditionary Force; North Africa Campaigns; Strategy. Dep. director of mechanisation at the war office, 1938-39, promoted major-general in 1939, he commanded the 50th division in France in 1940 and was head of the British military mission in Moscow in 1943. He retired in 1944 with the rank of lieut.-gen., and was created a K.C.B. in the same year. He published military books, *e.g.* *Our Armoured Forces*, 1945.

Martel de Janville, SYBILLE GABRIELLE MARIE ANTOINETTE DE RIQUETI DE MIRABEAU, COMTESSE DE (1849-1932). French novelist, well known by her literary pseudonym of Gyp. A great-grand-niece of Mirabeau, she was born in Morbihan, Brittany, August 15,

1849, and was educated at the convent of the Sacré Coeur. She became the author of a long series of novels and sketches, famous for their gaiety, vivacity, and wit. They range from *La Vertu de la Baronne*, 1882, down to the First Great War satire of *Les Profitards*. She was also a painter of some talent, and made a reputation, under the name of Bob, as a caricaturist. In politics she was connected successively with the Boulangist, anti-Semite, and nationalist movements. She died June 29, 1932.

Martello Tower. A type of building erected for coast defence. Named after a tower on Cape Mortella, Corsica, which a British squadron, when succouring the Corsican insurgents in 1794, found almost impregnable against their attacks, this type was used in the defences built round the S. and E. coasts of England in preparation for Napoleon's threatened landing. About 40 ft. high and frequently surrounded by a moat, martello towers are of solid masonry and contain rooms for a garrison of about 30. The only entrance is some 20 ft. above the ground, reached by a ladder or drawbridge. A platform on the top served for the guns, which were protected by a parapet. Although erected at enormous cost, the towers were never used, and being defenceless against 20th cent. weapons they are now mostly deserted. A few have been converted into private residences and coastguard stations.

Marten (*Ma te*). Genus of carnivorous mammals belonging to the weasel family. They differ from the weasels, stoats, and polecats in their larger size, longer limbs, tree-climbing habits, and in details of dentition. They have fine and valuable fur of reddish-brown colour, and a long and bushy tail. There are several species, of which only the pine marten occurs in Great Britain. This species has chocolate-brown fur, with orange chest and throat, and the edges of the ears are white. A fine specimen will mea-

sure 20 ins. in length. It was formerly fairly common in the British Islands, but persecution has now made it rare, and it is only found in secluded localities. It occurs in pine woods in N. Wales, the Lake District, the Scottish Highlands, and in the N. of Ireland, and ravages the covert and the poultry yard. On the W. coast of Scotland it feeds to some extent on shellfish, and it will often eat fruit. Savage in disposition, it will fight furiously with dogs if surprised at a distance from trees. The beech marten, which has white underparts, is common in Central and S. Europe. See Sable.

Marten, MARIA. Victim of a notorious murder. William Corder, of Polstead, Suffolk, formed an attachment with Maria Marten of the same village, but, becoming tired of the girl, he lured her to a lonely building, called the Red Barn, where he murdered her, burying the body. The girl's step-mother, who was aware of the meeting at the barn, eventually became suspicious and per-

suaded her husband to dig up the floor of the building, where the corpse was discovered. Corder was arrested and found guilty at the assizes which opened at Bury St. Edmunds on Aug. 4, 1828. He was hanged a week later. Shortly afterwards a play entitled *The Red Barn*, or *The Mysterious Murder*, was produced at the Royal Pavilion Theatre, Mile End, London, and has since been revived on numerous occasions.

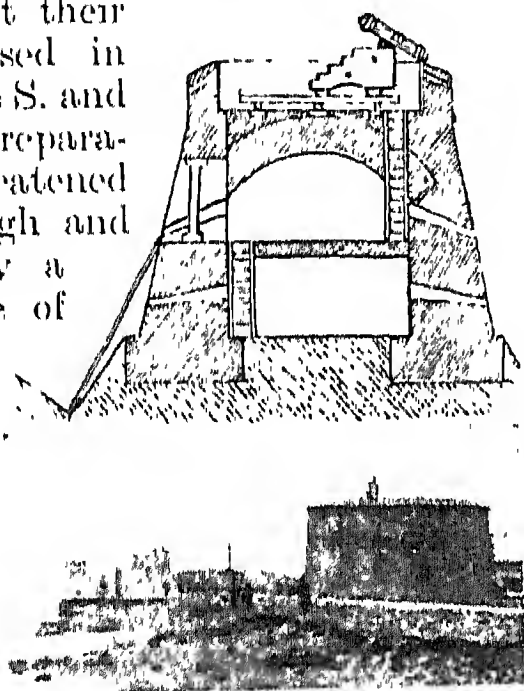
Martens, ADOLF (1850-1914). German engineer. Born at Beckendorff, March 5, 1850, he worked in a factory at Güstrow, 1867-68, and then studied at the industrial academy at Berlin, being afterwards employed in railway bridge construction. In 1879 he was appointed to a chair in the Berlin technical university, and in 1884 became director of the institute for mechanical experiments. He acquired a considerable reputation by his researches

on the resistance of metals for technical purposes, and contributed largely to the science of metallurgy, giving his name to martensite (*v. l.*). He died July 24, 1914.

Martensite. The hardest constituent commonly found in steels. It has a Brinell Hardness of up to 800. Martensite is the first decomposition product obtained on cooling a steel. If a steel is heated above the upper critical point, which is about 900° C. for pure iron, but varies with the carbon content of the steel, all the carbon in the steel goes into homogeneous solid solution. This is quite soft. But in an ordinary carbon steel it is impossible to retain its face-centred cubic lattice structure at room temperatures however quickly the steel is cooled. By very rapid quenching it is possible to prevent the steel from reaching its normal equilibrium structure of pearlite with varying amounts of cementite or ferrite and to produce the intermediate structure of martensite. This is either body-centred tetragonal or body-centred cubic and, furthermore, being alpha iron it will not dissolve carbon. The result is that bulky molecules of iron carbide form inside the lattice structure and so peg it that the atoms cannot easily slide over each other. For this reason the martensite is extremely hard and brittle, having the appearance of a number of fine, white needles when seen under the microscope. See Austenite; Iron; Metallography; Pearlite; Steel.

Martha. New Testament character. In Luke 10 and John 11-12 she is represented as the sister of Lazarus and Mary, at whose house Jesus stayed when in Bethany. Martha serves as an example of the virtue of hospitality, but is gently reproved for her somewhat over-anxious, bustling spirit, which led her to pay more attention to the bodily comfort of her Guest than to His teaching.

Martha's Vineyard. Island off the S. coast of Massachusetts, U.S.A., forming, with the Elizabeth Is., Dukes co. Situated 5 m. from Cape Cod, its greatest length is 21 m., greatest width 10 m.; its area is 108.7 sq. m. It has a level surface, relieved in the W. by a hill ridge reaching 308 ft. Once a whaling and trading centre, it has fisheries and small farms today, but is noted chiefly as a summer resort. Edgartown, the co. seat, has a pop. 1,370. The island was discovered 1602; Great Harbour (near Edgartown) was settled 1612. Pop. (Dukes co.) 5,669.

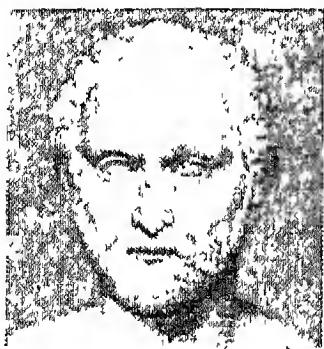


Martello Towers on the coast at Hythe, Kent. Top, sectional diagram of internal arrangement



Marten. Specimen of the pine marten, *M. martes*

Martial (c. 43-c. 104). Roman epigrammatist. Marcus Valerius Martialis was born at Bilbilis in Spain, and came to Rome in 66. The early part of his life in Rome was a rather sordid struggle, but the latter years, when he became possessed of a small country house



Martial, Roman epigrammatist
From a bust

in the Sabine hills, were passed in comparative comfort. His life was that of a parasite, as is evidenced by his fulsome flattery of his patrons, especially of the sinister emperor Domitian. The great majority of his writings are epigrams, which afford valuable information on every aspect of the life of the period. Many of the epigrams are grossly indecent, but are the work of a brilliant literary genius, with an extraordinarily flexible style, polished wit, a keen sense of the ridiculous, a tolerant, kindly temperament, and a genuine love of nature and the homely pleasures of a country life. Weary of Rome, he retired in 98 to his birthplace, where he died.

Martial Law. Term somewhat loosely employed to indicate the suspension of the administration of normal civil law and its replacement by military authority, when such a change is rendered desirable by special circumstances, of which war and rebellion are the most usual examples.

The term martial law does not signify a law in the usually accepted sense, but essentially the enforcement of the authority and power of the military commander of the district affected, who becomes responsible for taking whatever measures he considers advisable for ensuring the safety of the state and its loyal subjects. Before a district is placed under martial law, a proclamation is published by the executive, notifying the public generally that ordinary law is insufficient to cope with the situation, after which the military authority specifies what, if any, special regulations will be applied, and issues orders regarding such restriction of personal and public liberty as is thought necessary to the public safety.

The advantage of martial law in times of emergency is that exceptional means of arrest and punishment may be taken against persons who resist the government or aid

the enemy, and that it is readily possible to define as punishable offences any conduct which a rapidly changing military situation shows to be inimical to the success of the government forces. Under martial law, the ordinary civil courts may be maintained coexistent with, or entirely replaced by, military tribunals. Minor offences are dealt with by duly authorised officers, and the more serious by military courts which have unlimited powers of punishment. In British practice, the military tribunals are usually constituted as courts-martial (*q.v.*), and the procedure followed is that of military law, the sentences being confirmed in accordance with the provisions of the Army and Air Force Act (*q.v.*).

Under the Petition of Right, which is reproduced in the preamble to the Army Act, martial law is illegal in Great Britain in times of peace, but it is legalised by various Acts which provide for it to be employed, whether the ordinary courts are open or not, in times of emergency. Naturally, its enforcement involves suspension of the privilege of Habeas Corpus. After the suspension of martial law an Act of indemnity is always passed to protect any person responsible for its administration, who has exceeded his powers in good faith. Martial law cannot be made retrospective, and can only be enforced in the districts within which it has been proclaimed. But under special circumstances a person arrested outside such a district may be brought within it and tried by the military tribunal.

Martial law has been enforced but rarely in Great Britain. During the Second Great War, in expectation of invasion, provision was made for setting up war-zone courts to try criminal cases in places in which, because of enemy action, it might be impossible for ordinary law to function. These courts would not have been military courts, as it was provided that the president must be a judge of the supreme court. Fortunately, it never became necessary to make use of these provisions. Martial law was enforced in the war area during the South African War, in parts of Ireland in 1920 and 1921, and frequently in India and Palestine. Martial law must not be confused with military law which applies to sailors, soldiers, and airmen for the purpose of enforcing discipline. Military law is to be found in the Naval Discipline Act and the Army and Air Force Acts. See Court Martial.

Martigny. Town formed from three villages in canton Valais, Switzerland. It stands on the river Drance, 41 m. by rail S.E. of Lausanne. The Roman Octodurus, it is on the historic route over the Great St. Bernard to Aosta. On the Simplon rly. to Italy, the starting-place of the electric rlys. to Chamonix, and of the route to the Val de Bagnes, it is a busy place in the tourist season.

Martigues. Harbour of S. France, in the dept. of Bouches-du-Rhône. It is built on three islands connected by bridges, on the S. side of the Étang de Berre near its outlet to the Gulf of the Lion, and is connected with Marseilles by rly. Pop. (1954) 15,150.

Martin. Name given to various members of the swallow tribe. Two species occur in Great Britain, the house martin and the sand martin. The former (*Delichon urbica*) is a familiar summer visitant, arriving in April and May and migrating to Africa about the middle of Oct. The plumage of the upper parts is black with violet reflections, and of the lower parts pure white. It is slightly smaller than the swallow, with shorter wings and a less forked tail. Its nest is fixed to a wall, generally under the eaves of a house, and is formed of mud strengthened with hair and fibres, and lined with feathers. Two broods are reared.

The sand martin (*Riparia riparia*) arrives in spring before the house martin, and leaves early in Sept., and is fairly common in many parts of Great Britain, except in the extreme N. It is mouse coloured above with white below, and has a rather short tail. It nests in burrows in



Sand Martin at the entrance to its nest
W. S. Berridge, F.Z.S.

sand pits and banks of clay, usually three or four ft. deep and sloping upward to the breeding-chamber, where a nest of hay and feathers is constructed. The same burrow is used each year.

Martin (c. 316-c. 400). Saint and bishop. A native of Pannonia, he was educated at Pavia, and became an officer in the army under Constantine and Julian. Leaving the army, he placed himself under S. Hilary of Poitiers, and after labouring as a missionary in Pannonia he founded a monastery near Poitiers, about 360, and there he remained till he was appointed

bishop of Tours in 371. He wrote Confession of Faith in the Holy Trinity. Martinmas is his feast.

Martin. Name of five popes, of whom three are noticed separately. Martin II and III are more accurately named Marinus I and II respectively, Marinus having been written Martinus in error. The former was pope from 882 to 884, the latter 942-46. The former, who had attended the council of Constantinople in 869 as the representative of western Christendom, was intimate with Alfred the Great.

Martin I (d. 655). Pope from 649 to 654. He was born at Todi on the Tiber, and on his election to the papacy he at once pronounced against the monothelite heresy, then maintained by the emperor Constans II and by Paul, patriarch of



Martin I, Pope, 649-54
From a medal

Constantinople. In 653 the emperor, instigated by Paul, sent an exarch to Rome, demanding the surrender of the pope. Martin yielded to avoid bloodshed, and after being imprisoned near Constantinople was exiled to Cherson, where he died Sept. 16, 655. He is honoured as a saint in the Eastern and Latin churches, his festival being Nov. 12 in the latter communion. *Consult Lives of the Popes in the Middle Ages*, H. K. Mann, 1902.

Martin IV (c. 1210-85). Pope 1281-85. A Frenchman, born in Touraine and named Simon de Brie, he was chancellor of France under Louis IX, 1260, cardinal, 1261, and papal legate in France for over 20 years. After his election to the papacy he was the instrument of Charles of Anjou, upon whom he depended for protection. After the massacre known as the Sicilian Vespers, Martin still tried to keep Sicily for France, and even ordered a crusade against the king of Aragon, whom the Sicilians had chosen for their ruler. He died at Perugia, March 28, 1285.



Martin IV, Pope, 1281-85
From a coin

Martin V (1368-1431). Pope 1417-31. Otto di Colonna was one of the cardinals who deserted Gregory XII and took part in the council of Pisa, 1409, and the

election of the anti-popes Alexander V and John XXIII. On his election as undisputed pope at the council of Constance by the representatives of the five nations—German, French, Italian, Spanish, and English—which put an end to the Great Schism, he took the name of Martin. The chief activity of his pontificate was the re-establishment of the temporal affairs of the papacy, entirely disorganized as a result of the Schism, together with the restoration of the city of Rome itself and the Papal States. In all these schemes his chief assistants were members of his own family of the house of Colonna, on whom he lavished in return important ecclesiastical and secular offices. In accordance with the decree of Constance summoning a council within five years, he convened the council which opened at Pavia in 1423, but dissolved it on Feb. 26, 1424. He died Feb. 20, 1431.



Martin V, Pope, 1417-31
From a coin

Martin, (BASIL) KINGSLEY (b. 1897). British journalist. Born July 28, 1897, he was educated at Mill Hill and Magdalene College, Cambridge, and was a lecturer at the London School of Economics, 1923-27. Next with the Manchester Guardian, in 1931 he became editor of the New Statesman and Nation. He wrote *The Triumph of Palmerston*, 1924; *French Liberal Thought in the 18th Cent.*, 1929; *The Magic of Monarchy*, 1937; *Propaganda's Harvest*, 1942.

Martin, SIR GEORGE (1764-1847). British sailor. He went to sea in 1776 and saw service in the W. Indies, 1779-80. Two years later he was given his first command. At the battle of Cape St. Vincent, 1797, he commanded the *Irresistible*, in which Nelson hoisted his flag when the *Captain* was disabled. Martin was appointed to the Northumberland, 1798, blockaded Malta and reduced Valletta in 1800, and after a brief period in Egypt returned to the Channel fleet, where, in command of the *Barfleur*, he fought in the battle of



Sir George Martin, British sailor
After Lawrence

the battle of Cape Finisterre, 1805. In 1807 he blockaded Cadiz. Vice-admiral in 1810, he was knighted in 1814, became admiral in 1821, and commander-in-chief at Portsmouth in 1824. He died July 28, 1847.

Martin, SIR GEORGE CLEMENT (1844-1916). British organist and composer. Born at Lambourn, Berks, Sept. 11, 1844, he studied under Stainer and took his musical degree at Oxford in 1868. He was appointed master of song at the choir school of St. Paul's cathedral in 1874, and on the retirement of Stainer in 1888 became organist to the cathedral. Elected teacher of the organ at the R.C.M. in 1883, he was appointed to a similar post at the R.A.M., 1895, and knighted in 1897, on the occasion of the diamond jubilee of Victoria, for which he composed a special *Te Deum*. Martin, who pub. *The Art of Training Choir Boys*, died Feb. 23, 1916.

Martin, GLENN LUTHER (1886-1955). U.S. aircraft pioneer. Born at Macksburg, Iowa, Jan. 17, 1886, and educated at Kansas Wesleyan University, Salina, he began to build gliders in 1907, and in 1909 flew a bamboo aeroplane for 33 yds. at a height of 2 ft. He was founder president and general manager of a firm, already in aircraft production in 1914, which produced such well-known aircraft of the Second Great War as the Baltimore and the Marauder, and the Mars flying-boat. He died at Baltimore, Dec. 4, 1955.

Martin, HENRI (1810-83). French historian. Born at St. Quentin, Feb. 20, 1810, and baptized Bon Louis Henri, Martin was educated for the law, but devoted his life to historical research, although he was for a few years a member of the chamber of deputies. He died in Paris, Dec. 14, 1883. Martin's fame rests entirely on his *Histoire de France*, which, despite Guizot's condemnation as "bad history, bad philosophy, and bad literature," for long ranked as the standard history of France. A first and prizewinning edition in 15 vols., 1833-36, was followed by others, one being largely rewritten, and another abridged. A continuation in 6 vols. made it the most complete work of its kind.



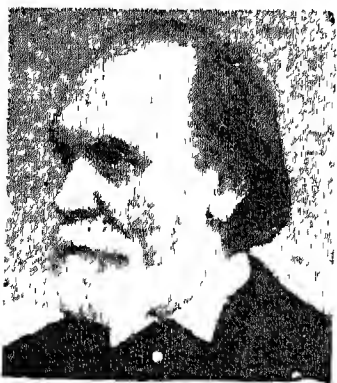
Henri Martin, French historian

Martin, HENRI JEAN GUILLAUME (b. 1860). French painter. Born at Toulouse, he was a pupil of

J. P. Laurens. In 1883 he received a medal for his picture Paolo and Francesca, in the Carcassonne museum. Inspiration, 1895, painted as part of a decorative scheme for the hôtel de ville, Toulouse, was bought for the Luxembourg, and Apparition of Clémence Isaure to the Troubadours, 1898, is in the hôtel de ville at Toulouse. He painted L'Étude for the Sorbonne, 1908; Le Travail, for the palais de justice, 1914; and was elected to the Académie des Beaux-Arts in 1917.

Martin, JOHN (1789-1854). British painter. Born near Hexham, July 19, 1789, he was apprenticed to a coach painter in Newcastle, and proceeded to London in 1806, where he earned his living for a time by painting china. In 1812 he painted his first picture, Sadak in Search of the Waters of Oblivion. A regular exhibitor at the R.A., 1812-52, he also showed work at the British Institution, where in 1817 his picture Joshua Commanding the Sun to Stand Still, was awarded a premium of £100, and in 1821 his Belshazzar's Feast gained a prize of 200 guineas. He took part in founding the Society of British Artists. He exhibited The Fall of Nineveh, at Brussels, 1833. He died at Douglas, Isle of Man, Feb. 17, 1854. Martin, whose work is very melodramatic, and shows a wild imagination, painted mainly in oils, but also in water-colour, chiefly landscapes and river scenes. He also illustrated the Bible and Paradise Lost. Among his chief works are Adam's First Sight of Eve, 1813; Clytie, 1814; The Fall of Babylon, 1819; and The Destruction of Herculaneum, 1822, in the National Gallery. *Consult* Life, T. Balston, 1948.

Martin, SIR THEODORE (1816-1909). British writer. Born at Edinburgh, Sept. 16, 1816, and educated at Edinburgh university, he became a solicitor, first in Edinburgh, and from 1846 in London. Literature was the occupation of his leisure hours throughout the whole of his long life.



Sir Theodore Martin,
British poet

Martin's fame, however, rests chiefly on his translations of Horace, 1882, his rendering of the odes being on the whole the most acceptable in the English language. He also translated

Catullus, Heine, and Dante. In 1866, at the request of Queen Victoria, he undertook the biography of the Prince Consort, which was published in five volumes from 1875 to 1880, in which year he was made K.C.B. Martin married the well-known actress Helen Faucit in 1851, and died at his home near Llangollen, Aug. 18, 1909.

Martin Chuzzlewit. Charles Dickens's fifth novel, originally published in monthly parts, Jan., 1843-July, 1844, with illustrations by Phiz, and in book form in 1844. Its avowed theme was selfishness and the retribution it invites, selfishness being made the besetting sin of the Chuzzlewit family, of whom the Martin of the title is the youngest representative. But the central figure is the arch-hypocrite Seth Pecksniff (*q.v.*). He and Sairey Gamp (*q.v.*), another character, are two of Dickens's greatest comic creations. Other popular figures are the gawky, simple-hearted Tom Pinch (*q.v.*) and the persistently "jolly" Mark Tapley (*q.v.*). Distressed by the initial falling-off in sales, Dickens altered his plans during the serial publication and introduced a highly satirical description of America, which he had visited in 1842-43. Other scenes of the story are laid in London and in a village which has been identified with Amesbury, Wilts.

Martindale, CYRIL CHARLIE (b. 1879). British Roman Catholic divine. He was born May 25, 1879, and educated at Harrow and Stonyhurst, and at Campion Hall, Oxford. He taught at Stonyhurst, Manresa House, Roehampton, and Oxford, and



C. C. Martindale,
British Roman
Catholic divine

rose to be a leading figure among British Jesuits. He travelled widely, wrote many books on religious subjects, dealing especially with missionary work, and edited the series of Catholic Thought and Thinkers. He was president of the federation of Catholic societies in universities of Great Britain. Father Martindale contributes the article Jesuits to this Encyclopedia.

Martineau, HARRIET (1802-76). British author. A sister of James Martineau, she was born at Norwich, June 12, 1802. In 1832 she achieved literary success

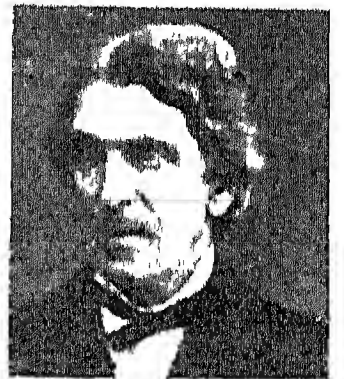
when her Illustrations of Political Economy, a series of tales written to demonstrate economic truth, brought the acquaintance of many leading men. In 1834 she paid a visit to America, then greatly agitated by the question of the abolition of slavery, and as an abolitionist herself had some unpleasant experiences. On her return she published Society in America, 1837.



Harriet Martineau,
British author

Her Forest and Game Law Tales, 1845-46, was followed in 1849 by a History of the Peace, a work embodying the views of the philosophic radicals. This was followed in 1851 by Letters on the Laws of Man's Social Nature. Originally a strict Unitarian, she now revealed herself as an agnostic, a fact which led to a breach with her brother James. A Condensation of Comte's Positive Philosophy, 1853, and an autobiography complete the list of Harriet Martineau's more important works. Other works show little originality of thought and less imagination, but she was possessed of an unusually clear and vigorous intellect, and was a talented expositor and populariser of the opinions of others. She died near Ambleside, June 27, 1876. *Consult* Lives, F. F. Miller, 1884; T. Bosanquet, 1927.

Martineau, JAMES (1805-1900). British theologian and philosopher. Born at Norwich, April 21, 1805, on his father's side of Huguenot descent, he received his early education at the local grammar school, and at Bristol.



James Martineau

Apprenticed to a civil engineer in 1821, he studied divinity at Manchester College, York, 1822-27, was ordained in 1828, served as a minister, and was professor of mental and moral philosophy and political economy at Manchester New College, 1840-57; professor of mental, moral, and religious philosophy there, 1857-69; and principal, 1869-85. With J. J. Taylor and C. Wicksteed, he edited

The Prospective Review, 1845-54. He died Jan. 11, 1900, and was buried in Highgate Cemetery.

A prominent Unitarian, an impressive preacher, and essentially an ethical teacher, eclectic and broadminded, discerning the interdependence of all forms of speculation, he based his intuitionist philosophy (see Intuition) on conceptions of God, freedom, and immortality. Martineau insists that, while prudence is concerned with our welfare, conscience forms character, and pleasure is the fruit of right doing, not its incentive. He won the affection of all who knew him. He wrote *The Rationale of Religious Enquiry*, 1836; *Unitarianism Defended* (with J. H. Thom and H. Giles), 1839; *Studies in Christianity*, 1858; *A Study of Spinoza*, 1882; *Types of Ethical Theory*, 2 vols., 1885; *A Study of Religion*, 2 vols., 1888; and *The Seat of Authority in Religion*, 1890.

Bibliography. *The Ethical System of J. M.*, J. H. Hertz, 1894; *J. M., a Biography and Study*, A. W. Jackson, 1900; *Lectures on the Ethics of Green, Spencer, and M. H. Sidgwick*, 1902; *Life and Letters of J. M.*, J. Drummond and G. B. Upton, 2 vols., 1902; *Life*, J. E. Carpenter, 1905.

Martinez de la Rosa, FRANCISCO (1789-1862). Spanish statesman and author. Born at Granada, March 10, 1789, he entered political life in 1813, and became prime minister in 1822. He was banished after the French occupation in 1823, and lived in Paris, where he resumed his literary work. Prime minister again in 1834, he introduced the statute creating constitutional government, but was compelled to resign the same year. He was ambassador to Paris, 1847-51, and died Feb. 7, 1862. A follower of the French romantics, Martinez wrote dramas, e.g. *Padilla's Widow*, and *The Conspiracy of Venice*, the historical novel *Doña Isabel de Solis*, epigrams, lyrics, etc.

Martinezia. Genus of small trees of the family Palmaceae, natives of tropical America. More or less armed with long, sharp spines, they have cylindrical trunks and large leaves broken up into wedge-shaped leaflets. The globular fleshy fruits are yellow or red, and contain a hard seed.

Martinez Sierra, GREGORIO (1881-1947). Spanish dramatist. Born in Madrid, May 6, 1881, he was educated at the university there, and joined the Spanish art theatre founded by his master Benavente. His first success as a

dramatist was achieved with *The Cradle Song*, 1911. He wrote some 40 plays and translated or adapted more than 50 others; many were introduced during the 1920s to British playgoers in the translations of J. G. Underhill and H. Granville-Barker, e.g. *The Kingdom of God*; *The Romantic Young Lady*.

In this playwright's treatment of fools, critics discerned a touch of Cervantes. After the civil war of 1936-39 he lived in voluntary exile in Buenos Aires. Returned to Spain in 1947, he died Oct. 1.

Martin-Harvey, SIR JOHN (1863-1944). British actor. Born at Wivenhoe, Essex, June 22,



Sir John Martin-Harvey,
British actor

1863, and educated at King's College School, he first appeared on the stage at 14. In 1882 he joined Irving at the Lyceum, remaining with him for 14 years, and took plays from the Lyceum repertory to the provinces. Under his own management he produced *The Only Way* in 1899; adapted from Dickens's *Tale of Two Cities*, this piece in which Martin Harvey played Sydney Carton established his reputation. He appeared in this part for very many years. He modelled himself on Irving, and added to his repertory such romantic plays as *A Cigarette Maker's Romance*, *The Corsicau Brothers*, *The Breed of the Treshams*, *The Lyons Mail*, and *The Bells*. He was for a long time better known and appreciated in the provinces than in London, possibly because of his choice of plays. But in 1912 Reinhardt produced for him *Oedipus Rex* at Covent Garden in strikingly original fashion, and in 1919, just after the First Great War, he scored a success with *The Burgomaster of Stilemonde*. His 1916 revival of *Hamlet*, his third production of that tragedy, was also esteemed for its simple and original staging. One of his last appearances was in *The Boy David*,



G. Martinez Sierra,
Spanish dramatist

1936. His wife, Helena (Nina) de Silva (1869-1949), was long his leading lady. Knighted in 1921, he took the hyphenated name of Martin-Harvey. He died May 14, 1944. *Consult* *Autobiography*, 1933; *The Last Romantic*, M. W. Disher, 1947.

Martini, FRIEDRICH (1832-97). Austro-Hungarian inventor. Born at Mohadia, Hungary, he entered the Austrian army, served in the engineers in the Italian campaign of 1859, and then settled as a civil engineer at Frauenfeld, Switzerland. Adapting his invention of a block action breech mechanism to the 7-groove, .45-in. calibre rifle of Henry, he offered the model to the British government, which adopted it in 1871 under the name of Martini-Henry rifle. *See* Rifle.

Martini, GIAMBATTISTA (1706-84). Italian musician. A native of Bologna he was born April 24, 1706, and having been ordained became chapel master at the church of S. Francesco there. Besides producing original compositions, he wrote two erudite musical treatises, *Storia della Musica* and *Saggio di Contrappunto*.

Martini, SIMONE (c. 1283-1344). Italian painter, commonly but wrongly known as Simone Memmi. Born at Siena, he was a pupil of Duccio. The earliest known example of his work is the fresco at Siena of *The Enthroned Virgin and Child*, painted 1315.



Simone Martini,
Italian painter

Then came the polyptych painted for the church of S. Caterina in Pisa, c. 1320. In 1328 he was at work in the Palazzo Pubblico at Siena on the equestrian portrait of Guidoriccio da Fogliano. His later art may be seen in the frescoes in S. Francesco, Assisi. In 1339 he went to Avignon, where he executed frescoes in the cathedral and the palace of the Popes, and where he met Petrarch and painted the portrait of Laura. He died at Avignon. Of his other works, the most notable are *The Annunciation* (Uffizi Gallery), *S. John the Baptist* (Altenburg Museum), *Christ Carrying His Cross* (Louvre), *The Crucifixion*, *Deposition*, and *Annunciation* (Antwerp Gallery). Martini is remarkable for decorative qualities of colour and line, and as showing a break with Byzantine influence.

Martinique. French island in the West Indies, since 1947 an overseas department of France. It is one of the largest of the Windward Islands and lies between the British islands of Dominica and Sta. Lucia. Almost wholly of volcanic origin, it has such well-known volcanic peaks as Vauclin (1,656 ft.), the Pitons de Carbet (3,955 ft.), and Mt. Pelée (*q.v.*) (4,500 ft.), the scene of a disastrous eruption on May 8, 1902. The slopes still retain much virgin forest, and sugar, cacao, coffee, tobacco, and fruit are produced in the fertile valleys. Sugar, rum, and cocoa comprise more than three-quarters of the exports. The chief harbour is Fort-de-France, and the towns are Lamentin and Gros Marne. St. Pierre was the chief town before its destruction in 1902. Discovered by the Spaniards in 1493, Martinique was settled by the French in 1635, and was British, 1794-1802 and 1809-14. The aborigines were exterminated by early settlers, and the inhabitants are chiefly blacks or creoles. The dept. is administered by a governor and council.

In May, 1942, an agreement was reached between American and French authorities concerning the immobilisation of the three Vichy warships that had been stationed at Martinique since June, 1940. The adherence of Martinique to the French committee of national liberation was announced on July 8, 1943. The three warships with twelve tankers and cargo ships in the harbour were placed at the disposal of the Allies; and gold sent to the island after the French surrender in 1940 was found intact. Area of island, 385 sq. m. Pop. (1954) 239,130.

Martinmas. Feast of S. Martin, Nov. 11. It is a quarter day in Scotland. The festival of S. Martin, the patron of reformed drunkards, is probably a survival of the Roman vintage festival, the Vinalia. At Martinmas hiring fairs for servants are held in some parts of England, and the Martinmas or

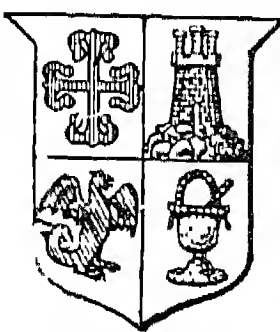
Martlemas ox, or mart, was killed to be salted for winter. In Germany, goose was a Martinmas dish. The spell of fine weather sometimes occurring around this date is called S. Martin's summer.

Martin's Bank. English bank, said to be the oldest in the country, now amalgamated with the Bank of Liverpool. Founded by Sir Thomas Gresham *c.* 1570, it first did business at the sign of the Grasshopper in Lombard Street. It belonged in the 17th cent. to Charles Duncombe, then to Richard Smith, and in 1703 was owned by Thomas Martin and Andrew Stone. After taking the name of Martin's Bank, it became a limited liability company. At the time of the amalgamation in 1918 it had a paid-up capital of £1,000,000, and its head offices were 68, Lombard Street, London, E.C., still the main London office.

Martlesham. Village of Suffolk, England, 6 m. E. of Ipswich. Before the Second Great War all new aircraft were officially tested at the adjacent Martlesham aerodrome. It was a U.S. bomber base during the air offensive on Germany, and later became an Air ministry experimental centre.

Martlet. Heraldic term for a small bird of the swallow tribe. It is shown without beak or feet, an innovation since the 15th century. In cadency it is the mark of the fourth son and his descendants. See Cadency; Heraldry.

Martos. Town of Spain, in the prov. of Jaén. It stands on a castle-crowned hill, 15 m. by rly. S.W. of Jaén, and carries on a trade in wine, oil, fruit, etc. In the vicinity are sulphur springs and baths. Martos was the Iberian Tucci and the Colonia Augusta Gemella of the Romans. Ferdinand III took it from the Moors. Pop. (1950) 30,404.



Martos arms



Martos, Spain. View showing the ancient Moorish castle crowning the hill on which the city stands

Martyn, HENRY (1781-1812). English missionary. He was born at Truro, Feb. 18, 1781, and edu-



Henry Martyn, English missionary

cated at Cambridge, where he came under the influence of Charles Simcon. In 1805 he was appointed chaplain to the East India Company, and devoted the rest of his life to missionary work, translating the N.T. into Hindustani, Hindi, and Persian. He died at Tokat in Asia Minor, Oct. 16, 1812, while on his way back to England.

Martyn, JOHN (1699-1768). English botanist. Born in London, Sept. 12, 1699, he was devoted to botanical studies from early youth, and when only 21 years of age translated and elaborated Tournefort's Catalogue of Plants Growing about Paris, though he did not publish it until 1732. Some public lectures delivered by him in London led to an invitation to do similar work at Cambridge. In 1732 Martyn was elected to the chair of botany there, and held it till 1762. He published a flora of Cambridge, 1727, Tabulae Synopticae Plantarum Officinalium, 1726, and Historia Plantarum Rariorum, 1728-37. He died Jan. 29, 1768.

Martyn, THOMAS (1735-1825). English botanist. A son of John Martyn, the botanist, he was born at Chelsea, Sept. 23, 1735, and studied at Cambridge, where he succeeded his father as professor of botany in 1762, in which year he took priest's orders. He became the most active agent in popularising the Linnaean system in England. He published Plantae Cantabrigienses, 1763, and a new edition of Miller's Gardeners' Dictionary—in reality a new work based upon Miller. He was F.R.S., and vice-president of the Linnaean Society. He died June 3, 1825, at Pertonhall, Beds, where he had been rector since 1804.



Thomas Martyn, English botanist

Martynia. Genus of herbs of the family Martyniaceae. They are natives of the warmer parts of America, especially Mexico. They have long-stalked, heart-shaped leaves, and tubular yellow, pink, or purplish flowers. The fruit is a



Martynia. The woody hooked capsule of the Mexican plant

large, woody capsule ending in two long curved hooks which catch in the fur or tails of quadrupeds, by which means the seeds are widely distributed. *M. fragrans*, with large red-purple fragrant flowers, is often grown in European gardens.

Martyr (Gr., a witness). Person, especially a Christian, who suffers death in testimony to his faith. One who suffers but does not lose his life is usually known as a confessor. The first Christian martyr was Stephen the Deacon, called the Protomartyr.

Apparently martyrs only were at first regarded as saints. Their tombs were held in high honour. When it became possible to erect special buildings for Christian worship, they were usually built over the tombs of martyrs, and the actual tomb was often converted into an altar, or the remains of the martyr were re-interred under the altar. This practice is alluded to in Rev. 6, v. 9; and a survival of it is seen in the placing of relics in the altars of R.C. churches at their consecration. Articles which had belonged to martyrs were regarded as precious relics, and the possession of the body, or part of the body, of a famous martyr at once gave eminence to a church, and later gave rise to pilgrimages. In this way a cultus grew up, which later developed into a general cultus of saints. A town or district in which a martyr had lived or suffered, or which possessed his relics, took him as its patron saint and often adopted his name, as St. Albans and Bury St. Edmunds.

At an early date it became necessary to check the genuineness of alleged cases of martyrdom, and this was known as the vindication of martyrs, which later developed into the official canonisation of saints generally. Rules were laid down restricting the use of the term.

Martyrology. In the R.C. Church, a list of martyrs, with notices of their life and death, designed for devotional uses. In monastic institutions such a list is

read from at prime after the prayer, *Deus, qui ad principium*, and followed by the versicle, Precious in the sight of the Lord is the death of His Saints, and a prayer of intercession addressed to the heavenly court. After prime or tierce it was a monastic custom to adjourn to the chapter and to read the martyrology and say prayers that now form part of prime.

All western martyrologies are based upon that attributed to Jerome, which may have been derived from a work used in S. Gregory's time in Rome; that discovered at Ravenna about 850 and known as the Lesser Roman Martyrology; and that attributed to Bede. The standard Roman Martyrology, largely the work of Usuard (c. 875), a French monk, and first printed in 1486, was revised by Baronius in the 16th century, and under Urban VIII in the 17th century. A Cistercian martyrology was issued at Rome in 1733-48. The Menologium of the Eastern Church was compiled in 886 and edited by Cardinal Urbino in 1727. A Syrian martyrology, written about 412, was discovered by W. Wright, and published 1866. Jean Crespin's *Histoire de Martyrs* celebrates the Protestant martyrs of the 16th century; the best known English work of a similar character is the *History of the Acts and Monuments of the Church*, John Foxe, 1563.

Marvell, Andrew (1621-78). English poet, satirist, and politician. Son of Andrew Marvell, rector of Winestead, in Holderness, Yorkshire, he was born March 31, 1621, and educated at Hull Grammar School and Trinity College, Cambridge. He became in turn tutor, at Nun Appleton, the scene of his lyrical poems, to Mary, daughter of Lord Fairfax and afterwards duchess of Buckingham, and to William Dutton, a nephew of Cromwell, at Windsor. In 1657 he was appointed Milton's colleague in the Latin secretaryship. From Jan., 1669, until his death, he was M.P. for Hull. He died in London, Aug. 16, 1678, and was buried in the old church of St. Giles-in-the-Fields.



Andrew Marvell,
English poet

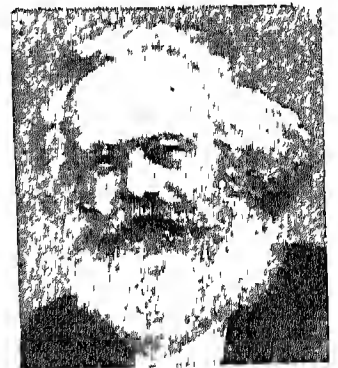
Known in his lifetime chiefly as a Cromwellian, as a friend and colleague of Milton, as an M.P., a pamphleteer and a satirist, his

fame as a poet came later. His widow published a collection of his miscellaneous poems in 1681, and an edition including the political satires was issued in 1726. The complete works did not appear until 1776. His poems, especially those on gardens and country life, display an exquisite feeling for nature and language. Those by which he is chiefly remembered are the Horatian Ode to Cromwell, On Appleton House, To His Coy Mistress, Thoughts in a Garden, and The Nymph Regretting the Loss of her Fawn. In his satires he tended to distinguish between Charles I and his advisers; he attacked Clarendon and the court party, and, in Hodge's Vision, bitterly assailed Charles II. He finally condemned the house of Stuart, despaired of Parliament, and favoured a republicanism after the model of Rome and Venice.

The site of the cottage at Highgate in which Marvell lived is marked by a tablet in Waterlow Park. Consult Lives, J. Dove, 1832; A. Birrell, 1905; Works, A. B. Grosart, 4 vols., 1872-75; Poems and Satires, ed. G. A. Aitken, 1892.

Marwick Head. Headland of Mainland, one of the Orkney Islands. It is also the name of a hamlet in Lewis, 8 m. from Stornaway.

Marx, Heinrich Karl (1818-83). German economist and the founder of international revolutionary socialism. Born at Trèves, May 5, 1818, of Jewish origin, he was educated at the universities of Bonn and Berlin, where he studied history and philosophy. Giving up his first idea of an academic life, he became in 1842 editor of *The Rhenish Gazette*, a journal whose advanced views led to its suppression by the authorities. In 1843-45 he was in Paris, engaged in literary work, and formed his lifelong friendship with Engels (q.v.). Expelled from Paris as a dangerous person, he settled at Brussels, where with Engels he drew up, in 1847, the manifesto of the Communist Party which may be regarded as the foundation of modern socialism.



Karl Marx,
German economist

In 1848 Marx returned to Germany to take part in the revolutionary outbreaks of that year in the Rhine country, but all the movements ended in failure, and in 1849 Marx migrated to London.

where he spent the rest of his life, and where he took an active part in founding and directing the affairs of the International Working Men's Association, which came to an end in 1873. In 1867 appeared the first vol. of Marx's work, *Das Kapital* (Capital); two further vols. appeared after his death, which took place in London, March 14, 1883.

Marx was a leading exponent of what is known as the materialist conception of history, i.e. he believed that the basis of historical development is to be found above all in economic considerations. On the purely economic side he held the theory, not generally accepted, that the value of any article or product depends upon the amount of labour expended on it, as measured by time. Labour, he further taught, produced far more than it consumed, and this surplus value, as he termed it, was inevitably appropriated by the capitalist, who allowed to the labourer in wages only enough to provide for a bare subsistence and enable him to reproduce his kind. From this it followed that there could be nothing in common between the employers and the employed, or proletariat. The latter must recognize this by developing a class-consciousness which, when sufficiently developed, would result in a class war, in which the whole capitalist system would be overthrown.

Many socialists claim that Marx was the first to remove socialism from a humanitarian and place it on a scientific basis. His views form the basis of Marxist Communism, as established in the U.S.S.R. See *Capital*; *Communism*; *International, The*; *Socialism*. Consult *Lives*, E. H. Carr, 1938; C. J. S. Sprigge, 1938; I. Berlin, 1939; *What Marx Really Meant*, G. D. H. Cole, 1934; *The Red Prussian*, L. Schwarzschild, 1948.

Marx, Wilhelm (1863-1946). German statesman. He was born at Cologne, Jan. 15, 1863, studied law at Bonn, 1881-84, became a deputy judge in 1888, a county judge in 1894, and, in 1921, president of a senate of the Kammergericht, Prussia's highest court, in Berlin. A member of the Roman Catholic party, and of the Prussian diet from 1899 to 1918, of the Reichstag from 1910 to 1918, and again from 1919 until 1933, Marx was appointed Reich chancellor, with a cabinet of the moderate bourgeois parties, for the first time in Nov., 1923. He resigned in Jan., 1925; was re-appointed in May, 1926, and again resigned in June, 1928. In the interval he had stood

for the Reich presidency, as candidate of the left, in the spring of 1925, but had been defeated by Hindenburg. In 1926 Marx was Reich minister of justice, and in 1928 he resigned the chairmanship of the Centre party. In 1933, after the abolition of his party by Hitler, he retired from public life, in which he had been known as an honest mediator, but never as an innovator. He died in 1946 near his native town.

Marx Brothers. Name of a Jewish-American family of film comedians. Arthur (Harpo) born Nov. 21, 1893, Julius (Groucho) born Oct. 2, 1895, Leonard (Chico) born May 22, 1891, and Herbert (Zeppo) born February 25, 1901, formed a troupe and became famous as the Four Marx Brothers, though their number was later reduced to three by the retirement of Zeppo, whose last film was *Duck Soup*. Their reputation was based upon their unusual form of wit, the essence of which was a serious treatment of illogical situations accompanied by clowning, verbal sallies, and musical interludes. Their first film *Coconuts*, which appeared in 1929, was succeeded by *Animal Crackers*, 1931; *Horse Feathers*, 1933; *Duck Soup*, 1934; *A Night at the Opera*, 1936; *A Day at the Races*, 1937; *The Big Store*, 1941; *A Night in Casablanca*, 1946.

Mary. Town of Turkmen S.S.R., capital of a region of the same name. Developed during the 19th century, it lies on the Murgab, 18 m. W. of ancient Merv. It makes wool and cotton textiles, carpets, and metal goods, and has food factories. Pop. (est.) 50,000.

Mary region spans the r. Murgab, along which cotton is cultivated in a narrow artificially irrigated belt, and includes the Murgab (or Mary) oasis where lucerne and wheat are grown. Mary region is crossed by the Trans-Caspian rly. Area 34,700 sq. m. Pop. (est.) 265,000.

Mary (Heb. Miriam). Saint and virgin, the mother of Jesus Christ. She was espoused to Joseph, a carpenter, of Nazareth. Being told by the angel Gabriel that she should become the virgin mother of the Son of God, and greeted with the words, Hail, thou art highly favoured, she replied with submission: Behold the handmaid of the Lord; be it unto me according to thy word. To her kinswoman, Elizabeth, mother of John the Baptist, recalling the song of Hannah (1 Sam. 2), she expressed her joy in the words of

the Magnificat (*q.v.*). She went with Joseph to Bethlehem, and there gave birth to Christ.

At Jerusalem, when Jesus was 12 years old, on the occasion of the Passover, Mary and Joseph found Him in the Temple, hearing and asking questions of the doctors. Mary was present at the marriage feast at Cana: at Capernaum; on Calvary, where Jesus committed her to the care of S. John, and with the disciples at prayer after the Ascension (Matt. 1 and 2; Luke 1 and 2; Mark 3; John 19; Acts 1). According to tradition Mary died at Jerusalem. Her tomb, it is said, was found vacant; hence the R.C. feast of the Assumption.

Since ancient times much discussion has surrounded the problem whether Mary had other children besides Jesus (*see* Matt. 12 and 13; Mark 3 and 6; Luke 1 and 2; John 2 and 7; Acts 1; 1 Cor. 15). Of three main views, the Hieronymian, held by Jerome, regards the "brethren" as cousins, sons of Mary, wife of Alphaeus or Clopas; that of Epiphanius, held by the Eastern Church, and the most ancient, that they were sons of Joseph by a former wife; and that held by Helvidius, that they were born to Mary and Joseph after Jesus. Much depends on the interpretation of the word "brethren." The title *Theotokos*, Mother of God, has been applied to Mary since the council of Ephesus, 431. See *Annunciation*; *Assumption*; *Immaculate Conception*; *Incarnation*; *Jesus*; *Madonna*; *Mariolatry*.

Mary I (1516-58). Queen of England. The daughter of Henry VIII and Catherine of Aragon, she was born at Greenwich, Feb. 18, 1516. Brought up as heir to the throne, she was harshly treated by her father after his divorce of Catherine, and was even forced to sign a declaration acknowledging the union of her parents to have been illegal, and renouncing the authority of the pope. She remained faithful, however, to the R.C. religion, living in retirement chiefly at Hunsdon and Kenninghall, until the death of Edward VI on July 6, 1553. Despite the efforts of the duke of Northumberland to secure the succession for Lady Jane Grey (*q.v.*), Mary had popular support, gathered a force from E. Anglia, and was proclaimed queen in London, July 19.

She behaved at first with leniency. Her reign was inaugurated by Acts of parliament declaring her legitimacy, restoring the Latin Mass and the celibacy of the clergy,

and abolishing the title of supreme head of the Church which Henry had assumed. New bishops were consecrated, and by Dec., 1554, the reconciliation with Rome was virtually complete. In the face of strong popular opposition, Mary married Philip II of Spain, July, 1554. The rebellion of Sir Thomas Wyatt (*q.v.*) had led to the execution of Lady Jane Grey in Feb.

A stern persecution of Protestants began in 1555. The queen, embittered perhaps by her early life, the failure of her marriage, ill-health, and childlessness must bear some responsibility for the persecutions which brought some 300 persons to the stake during the last three years of her reign, notably the bishops Hooper, Latimer, Crammer, and Ridley; but they were not so much personal victims of "Bloody Mary" as victims of the abrupt and ill-adjusted return to the old laws against heresy. Without the worldly wisdom of her half-sister Elizabeth, Mary had far deeper convictions. The final blow in an unhappy life was the loss of Calais to the French. Shortly afterwards Mary died, Nov. 17, 1558. See England: History.

Bibliography. Privy Purse Expenses of the Princess Mary, with Memoir by Sir F. Madden, 1831; History of Mary I, J. M. Stone, 1901; Philip and Mary, J. B. Mullinger, Cambridge Modern History, vol. ii, 1904; Two English Queens and Philip, M. A. S. Hume, 1908; The Reign of Mary Tudor, J. A. Froude, 1910; Mary Tudor, B. White, 1935.

Mary II (1662-94). Queen of England. The elder daughter of James, duke of York, afterwards



M. II
After Wissing

James II, and of Anne Hyde, she was born in London, April 30, 1662. She was married in Nov., 1677, to William, prince of Orange, and went to live in Holland. Placed in a difficult position by the events of 1688, she appears to have sympathised with her husband rather than with her father; at all events she followed William to England in 1689, and the pair were proclaimed king and queen of England and

then of Scotland. Crowned April 11, Mary was sovereign equally with her husband. The dignity of her private life and her staunch Protestantism made her respected, while her conduct of affairs while William was abroad showed spirit and shrewdness. On Dec. 28, 1694, Mary died of smallpox, and was buried in Westminster Abbey. She was childless. Consult The Third Mary Stuart, M. Bowen, 1929.



*Mary I,
Queen of England
After Holbein*

Mary (1542-87). Queen of Scots. Born at Linlithgow, Dec. 8, 1542, six days before the death of her father, James V, she then became queen of Scotland. In 1547 Somerset sought to compel the Scots to give their infant queen in marriage to Edward VI of England. To escape this Mary was shipped off to France, where she was brought up at the court under the charge of the Guises, the kinsfolk of her mother, Mary of Lorraine, who remained in Scotland and ruled on the child's behalf. In 1558 Mary was married to the dauphin Francis, who succeeded to the French throne in 1559, but died next year.

In 1561 Mary returned from France to a Scotland dominated by John Knox, in whose eyes she was a subject not for sympathy but for discipline, by reason especially of her loyalty to the R.C. religion, in which she had been brought up. Mary was left to fight her own battles and to select a husband from a crowd of suitors. She chose her cousin Henry Stuart, Lord Darnley, whom she married July 20, 1565.

Finding Darnley a broken reed, she gave all her confidence to her secretary, David Rizzio. The nobles, led by Morton, made ready use of Darnley's jealousy; and on March 9, 1566, conspirators murdered the secretary in the queen's presence in Holyrood Palace. Mary never forgave her husband, although there was a formal reconciliation after the birth on June 19 of her child, who afterwards became James VI. On Feb. 10, 1567, when Darnley was lying ill at a house called Kirk o' Field, near Edinburgh, and Mary was absent attending marriage festivities at Holyrood Palace, the house was blown up and the prince murdered. It has never been conclusively

proved that Mary had a hand in framing the murder plot; but that she knew that murder was afoot, and that Bothwell was the arch-conspirator, there is little question.

Bothwell was merely subjected to a mock trial, and acquitted. On April 24, he captured the queen herself after a barely formal show of resistance, and on May 15, after he had divorced his wife, Mary married him. The nobles rose in arms. At Carberry Hill, June 15, Bothwell escaped and fled the country, while Mary surrendered to the lords, by whom she was imprisoned in Loch Leven castle and compelled to abdicate in favour of James VI on July 24. On May 2, 1568, Mary escaped from Loch Leven, but only a few devoted loyalists gathered to her standard. They were defeated at Langside on May 13 by the regent Moray, and Mary escaped to England.

Elizabeth was guided by policy, not by generosity, and Mary was held in custody. A commission sat at York, nominally to hear the defence of the Scots lords for their rebellion, actually in order that their charges against Mary might be published. The commission was closed without giving her any opportunity of rebutting the evidence, and then for 18 years Elizabeth kept her a prisoner; while Roman Catholics formed plot after plot to liberate her and set her on the throne of England.



MARY

From a portrait of Mary Queen of Scots at Hardwicke Hall

to which, if the marriage of Anne Boleyn (*q.v.*) to Henry VIII was really invalid, she had an irrefutable claim on the score of descent.

Each plot was detected, but without investigation of Mary's complicity; since neither her acquittal nor her condemnation would have suited Elizabeth's plans. But when war with Spain had actually been declared in 1586, Elizabeth's secretary, Walsingham, was given a free hand. The strict supervision of Mary's correspondence was ostensibly withdrawn, but really maintained more closely than ever. The plot of Anthony Babington (*q.v.*) was revealed. At the trial, letters of Mary's were produced which, if genuine, were absolutely damning; but whether the damning parts of them were genuine or forged no man will ever know. Mary was found guilty on Oct. 25, and parliament demanded her execution. Elizabeth, after efforts at evasion, sealed the death warrant, Feb. 1, 1587. The council, without giving her time to recall it, put it in execution, and on Feb. 8 Mary was beheaded at Fotheringhay. Her beauty has become legendary, and of her courage there is ample evidence; but a passionate nature led her to commit such blunders that the interest in her career now belongs as much to romance as to constitutional history. See Bothwell; Casket Letters; Darnley, Holyrood; Knox. J.; Scotland.

Bibliography. The career of Mary has been used in stories, poems, and dramas. Among the last may be mentioned Schiller's *Maria Stuart*; Swinburne's trilogy, *Chastelard*, *Bothwell*, and *Mary Stuart*; Drinkwater's *Mary Stuart*; Gordon Daviot's *Queen of Scots*. Lives and studies include those by D. Hay Fleming, 1897; E. Linklater, 1933; M. Bowen, 1934; M. P. Willcocks, 1939. Consult also *The Casket Letters* and *M. Q. of S.*, T. F. Henderson, 2nd ed. 1890; *Love Affairs*, M. A. S. Hume, 1903; *The Mystery of M. Q. of S.*, A. Lang, new ed. 1904; *Trial*, ed. A. F. Steuart, 1923; *Persecution of M. S.*, Sir E. A. Parry, 1931; *In My End Is My Beginning*, M. Baring, 1931.

Mary (1658-1718). Queen of James II of Great Britain, known as Mary of Modena. Born at Modena, Oct. 5, 1658, she was the only daughter of the duke of Modena, a member of the Este

family, and was baptized Mary Beatrice Anne Margaret Isabel. Largely owing to the efforts of Louis XIV, she became by proxy in Sept., 1673, the second wife of James, duke of York. She went at once to England, where she lived until 1688, being regarded as a papal agent, and being certainly a strong and not very discreet Roman Catholic. In 1688 she fled to France. After the death of her husband, Sept. 6, 1701, Mary entered a convent, where she died May 7, 1718. Her surviving children were James Edward, the old pretender, and a daughter, Louisa.

Mary (1867-1953). Queen consort of George V of Great Britain, Ireland, and the British Dominions



Mary R.

Overseas, and Empress of India. Eldest child and only daughter of the duke of Teck and his wife, Mary (daughter of the 1st duke of Cambridge, and granddaughter of George III), she was born at Kensington Palace, May 26, 1867, and baptized Victoria Mary Augusta Louise Olga Pauline Claudine Agnes. She was known in the family circle as May.

During her girlhood she lived mostly at Kensington until 1883, then, after a sojourn in Florence, the family moved to White Lodge, Richmond Park. In 1891 she was betrothed to the duke of Clarence, the heir (after his father, the prince of Wales) to the British throne. He died, Jan. 14, 1892; and on May 3, 1893, the engagement of the princess to his brother, the duke of York, was announced. The marriage was celebrated July 6, 1893, in the chapel of St. James's Palace. The duke and duchess lived at York House, London, and York Cottage, Sandringham. On his father's accession as Edward

VII, 1901, the duke of York became duke of Cornwall, and, in Nov., prince of Wales.

The princess of Wales, now residing at Marlborough House, became widely known to the country by her performance of many public duties. With her husband she made a tour of the Empire, 1901, visiting Australia, 1906-07, and Canada, 1908. Crowned as queen consort in Westminster Abbey, June 22, 1911, she was crowned empress of India at Delhi in Dec. the same year.

During the First Great War, Queen Mary performed invaluable work for the women's organizations, *e.g.* the Queen's Work for Women Fund, 1914, Queen Mary's Needlework Guild (founded in the same year); and throughout that arduous period, 1914-18, she maintained her practical philanthropy, and her sympathy was shown on innumerable occasions. During the king's illness of 1928-29 she presided over the council of regency. In 1934 she named and launched the liner named in her honour, and in 1935 shared with the king the many engagements connected with the Silver Jubilee of the king's reign. After his death in 1936, when she returned to Marlborough House, she continued to appear at public ceremonies and, relieved of prime responsibilities, became a frequent visitor to theatres and concerts, and also spent much time in the company of her grandchildren. In the abdication crisis of Dec. 1936, she took no public part.

During the Second Great War she lived at Badminton, Glos. home of the duke and duchess of Beaufort, returning to Marlborough House in 1945.

Queen Mary's consistently regal appearance and deportment never failed to arouse admiring comment. A needlewoman of skill, she presented to the prime minister in 1950 a carpet in gros point, on which she had been working since 1941, to be sold for dollars. Thousands saw it when it was exhibited in the U.K., the U.S.A., and Canada before it was sold.

One of the most beloved of British queen consorts, she endeared herself to her people by her many charitable acts and sense of duty to the country's welfare during the periods of greatest crisis in its history. Her death on March 24, 1953, was widely and sincerely mourned. See *Dolls' House*; George V. Consult *Lives*, C. Cavendish, 1930; Sir G. Arthur, 1935.



Mary of Modena,
Queen of England

Mary (1515-60). Queen of James V of Scotland, and known as Mary of Guise and Mary of Lorraine. A daughter of Claude, duke



Mary of Guise,
Queen of Scotland
After Jameson

of Guise, she was born at Bar-le-Duc, Nov. 22, 1515. In 1534 she married Louis duke of Orleans, who died three years later. Henry VIII sued for her hand, but in 1538 she be-

came the wife of James V, to whom she bore two sons, who died in infancy, and a daughter, Mary. James died in 1542, and their daughter became queen, with Cardinal Beaton as regent. Beaton fell, and Mary and her daughter escaped to Stirling, where the child was crowned.

Mary of Guise now played a prominent part in Scottish politics, and formed a close alliance with France. Her chief obstacle was James, earl of Arran, now regent, who looked to England for support. In 1554 he resigned and Mary became regent. Able and honest, she was not popular, and had a bitter enemy in Knox. In 1559 she attempted to break the Protestant party by placing a garrison in Perth, but her action was ill-timed; she was forced to flee to Dunbar, and at Edinburgh was declared deposed, Oct. 21. Mary died in Edinburgh, June 11, 1560.

Mary (b. 1897). British princess, known as the Princess Royal, countess of Harewood. Only daughter of King George V and Queen Mary, she was born at York Cottage, Sandringham, April 25, 1897, and christened Victoria Alexandra Alice Mary. Her education was supervised by Mlle. Dussau, and during the First Great War she trained as a nurse at the Great Ormond St. hospital for children. She later became president of the girl guides. On Feb. 28, 1922, she married Viscount Lascelles, who in 1929 became 6th earl of Harewood (*q.v.*). Two sons were born to them: George Henry Hubert, 7th earl (b. Feb. 7, 1923), and Gerald David (b. Aug. 21, 1924). On the death of Princess Louise she was created Princess Royal, Jan. 1, 1932. She later became controller-commandant of the A.T.S. (maj.-gen. of W.R.A.C.). During the visit of George VI to N. Africa in the Second Great War she was a councillor of state. She resided mostly at Harewood House.

Mary Barton. Novel of Lancashire life by Elizabeth Cleghorn Gaskell, first published in 1848. It is a sympathetically told story of working-class life in Manchester during a period of distress. This was Mrs. Gaskell's first novel, written as a distraction after the death of an infant son.

Maryborough. English name of the town in Laoighis co. called by the Irish Port Laoighise (*q.v.*).

Maryborough. Town of Victoria, Australia, in Talbot co. It is situated in the Loddon valley, 118 m. by rly. N.W. of Melbourne, at an alt. of 1,787 ft. There are rly. workshops and iron-foundries. Gold is mined locally. Pop. 5,900.

Maryborough. Port in Queensland, Australia. It is 20 m. from the mouth of the Mary river, 167 m. N. of Brisbane, and on the coastal rly. linking Brisbane to Rockhampton. It is the outlet of the Gympie gold and Burrum coal fields, and has the biggest iron and steel foundries in Queensland. Timber is exported. Pop. 14,500.

Mary Celeste. A vessel concerned in a mystery of the sea. On Dec. 5, 1872, the brig *Dei Gratia*, commanded by Captain Morehouse, sighted the brigantine *Mary Celeste* about 130 m. off the coast of Portugal. Morehouse was a friend of Capt. Briggs, master of the *Mary Celeste*, and seeing no one at the wheel, he boarded the vessel. No one was on board, and there was no sign of disorder. The last entry in the log book was dated Nov. 24; but a slate in the captain's cabin recorded that on the 25th the *Mary Celeste* was passing N. of the island of Santa Maria in the Azores. During ten days she had to all appearances held her course for 750 m. unsteered.

Morehouse took the ship in tow and continued his voyage to Gibraltar. A cutlass was found, with what might have been bloodstains, and on the deck some marks which looked like spots of blood, while there were curious cuts on the bows. Briggs had been accompanied by his wife and daughter, and the ship carried a crew of seven. It was stated that the ship's boat was hanging on the davits when she was found.

Many explanations were advanced to account for the mystery. The cuts on the bows were shown to have no significance, and the stains on the cutlass were proved not to be blood. In 1929 Laurence Keating published a solution, *The Great Mary Celeste Hoax*, which was based on documentary evidence. According to his account Morehouse lent Briggs three of his crew at New York, the others in the *Mary Celeste* being a rough lot. One of the crew, Venholdt, soon got into a fight with the mate Hullock, who seems to have taken command of the vessel. Mrs. Briggs was accidentally killed by a piano falling upon her, and was buried at sea by the mate, contrary to the captain's wishes. Briggs began to drink heavily and disappeared one night after fighting with the mate. Hullock and Venholdt again came into conflict, and the latter went overboard and was never seen again. At Santa Maria the mate and two others deserted, taking the log containing Briggs's complaints, and when the *Dei Gratia* arrived at Santa Maria the *Mary Celeste* was in charge of the three members lent by Morehouse and the English cook Pemberton. Morehouse invented the story of finding a deserted vessel to avoid inquiries.

In 1885 the *Mary Celeste* was wrecked off Cienfuegos, Cuba, in suspicious circumstances.

Maryhill. Suburb of Glasgow, Scotland. Lying N. of the Kelvin, it is an industrial and working-class residential district, being distinguished by its long streets of "closes" or tenements. Here is Maryhill barracks, the depot of the Highland Light Infantry. Maryhill gives its name to a borough constituency of Glasgow including Ruchill.

Maryland. A twin-engined bomber designed by Glenn Martin (U.S.A.) for service in the Second Great War. It achieved particular success in the early Mediterranean campaigns of the R.A.F., proving superior in performance to current Italian fighters. Powered by two



Mary

Mary,
Princess Royal
Countess of
Harewood

Pratt and Whitney Twin Wasp radial engines of 1,050 h.p., the Maryland carried a crew of three and 1,250 lb. of bombs at a maximum speed of 304 m.p.h. Wing span was 61 ft. 4 ins., and length 46 ft. 8 ins.

Maryland. Alternative name given in the U.S.A. to the old German tune to which the song *Der Tannenbaum* was traditionally sung around the family Christmas tree. The tune was used for a song, Maryland, my Maryland, written by J. R. Randall, of Baltimore, in 1861, and was later popular as a hymn-tune. The same tune was adopted in the U.K. for the Socialist song The Red Flag.

Maryland. State of the U.S.A., one of the thirteen original states of the Union. It lies on both shores of Chesapeake Bay, and is bounded N. by Pennsylvania, E. by Delaware and the Atlantic, W. by Virginia and W. Virginia and the estuary of the Potomac. In the E. the surface is low and marshy; to the W. it is hilly, being crossed by ridges of the Alleghenies with some peaks over 3,000 ft. high. Agriculturally, Maryland is famous for strawberries, tomatoes, spinach, and tobacco. The capital is Annapolis, but Baltimore is much the largest place. Other cities are Cumberland, Hagerstown, and Frederick. The government is carried on by a governor and a general assembly, consisting of a senate and a house of delegates. The state sends two senators and seven representatives to congress. A commission appointed by the governor, and consisting of white and coloured members, provides for the welfare of the state's Negroes, about one-fifteenth of the whole. Area 10,577 sq. m. Pop. (1950) 2,343,001.

Maryland was settled by R.C.s in Charles I's reign and remains a centre of U.S. Roman Catholicism, the first American cardinal, James Gibbons, having been born in Baltimore. In the first U.S. census, 1790, 93 per cent. were of British stock. In the 1950 census 63,689 were registered as foreign-born, of whom 8,230 were from the U.K., 4,129 from Canada. Two famous Maryland writers are H. L. Mencken and Upton Sinclair. The walls of Johns Hopkins University, Baltimore, have murals representing various beautiful Maryland women, the gift of an anonymous donor.

Marylebone. London place-name. Popularly used for a metropolitan bor. of London, the title being officially St. Marylebone

(*q.v.*), Marylebone has given its name to a rly. terminus (originally of the Great Central rly., later of the L.N.E.R., and then of the Western Region of B.R.). Marylebone Road is a main thoroughfare from Edgware Rd. to Great Portland St. Regent's Park, which is within the bor., was once called Marylebone Park. *Pron.* marri-lebun.

Marylebone Cricket Club. English cricket club, regarded as the governing body of the game in England, usually referred to as the M.C.C. It dates from 1787, when some members of the White Conduit club began to play on Lord's ground in Dorset Square, and called themselves the Marylebone club. In 1788 the laws of cricket were revised by the club, and since then it has been generally accepted as the controlling body. All alterations in, and additions to, the laws must be accepted by a two-thirds majority of the members present at an annual meeting. The club, which owns Lord's cricket ground, is governed by a president (who holds office for a year), treasurer, four trustees, and committee of 15. The M.C.C. is responsible for representative English touring teams overseas. Presidents of the club have included Lord Hawke, Sir Pelham Warner, Prince Philip, duke of Edinburgh, and the 16th duke of Norfolk.

Mary Magdalene. Name of the woman mentioned with others in the N.T. as being healed of evil spirits and ministering to Christ of her substance. She was present at the Crucifixion, and it was to her that Jesus is said to have first appeared after the Resurrection. The name is generally understood as indicating that she was a native of Magdala, the modern El Mejdal, on the W. shore of the Sea of Galilee. Tradition identified Mary of Magdala with the unnamed penitent of S. Luke who anointed Christ with the spikenard. Gregory the Great decided that the two women were identical; on his authority the feast of S. Mary Magdalene was arranged, but the identity is rejected by the majority of modern critics.

Maryport. Seaport, market town, and urban dist. of Cumberland. It stands at the mouth of the river Ellen, 28 m. S.W. of Carlisle. The principal buildings include the churches of S. Mary and Christ Church. The chief industries are food canning, coal-mining, the manufacture of buttons, children's wear, surgical

instruments, furniture, and electrical equipment. Originally, called Ellenfoot, the town was renamed Maryport in 1750 because Mary Queen of Scots landed here in 1568. In 1750 also the building of the harbour was begun, and docks were added to it in the 19th century. In the vicinity was a Roman station, of which many remains have been found. Market day, Fri. Pop. (1951) 12,234.

Mary Rose. Fantasy in 3 acts by J. M. Barrie. This imaginative piece with its "fey" atmosphere is a notable example of Barrie's art. The heroine "disappears" into the realms of enchantment during a visit to a Scottish island (The Island which Likes to be Visited), and on her return home many years later is represented as untouched by age or experience. Produced at the Haymarket Theatre, London, April 22, 1920, with incidental music by Norman O'Neill, it ran for 399 performances. Fay Compton played Mary Rose, and Robert Loraine the double part of her husband and soldier son. It was revived several times.

Mary Ward Settlement. A British social welfare institute founded in 1891 by Mrs. Humphry Ward (*see* Mary Augusta Ward). In 1897 it moved into a new building at 5-7, Tavistock Place, London, W.C. (1), originally called, after a generous benefactor John Passmore Edwards, the Passmore Edwards Institute. It was renamed in 1921 to commemorate the founder after her death in 1920. Its activities include evening classes for adults, clubs for boys and for girls, a legal advice centre, and craft classes for old people. The St. John Ambulance Brigade, the United Nations Association, the Clarion Fellowship, and other societies hold public and committee meetings on the premises. A school for physically handicapped children, founded by Mrs. Ward in 1898 and taken over by the L.C.C., meets in an adjoining building.

Marzipan (Ger.). Sweetmeat made of ground almonds and sugar in about equal proportions, bound with egg and flavoured with lemon juice, rose water, or orange flower water. It is used as an icing for cakes and as a sweetmeat, and is often called almond paste. Marchpane is the older English name.

Masaccio (1401-c. 1428). Florentine painter. Born at Castel San Giovanni di Valdarno, Dec. 21, 1401, he was named Tommaso

Guidi, but is invariably known by his nickname Masaccio, meaning loutish Tom. In 1417, commissioned to decorate a chapel for Cardinal San Clemente, he painted a Crucifixion and scenes from the lives of SS. Catherine and Clement. Between 1423 and 1428 he painted 12 frescoes in the Brancacci Chapel in the Carmine, representing scenes from the Bible. He died in Rome about 1428. His Madonna and Child with Angels was acquired for the National Gallery, London, 1916.

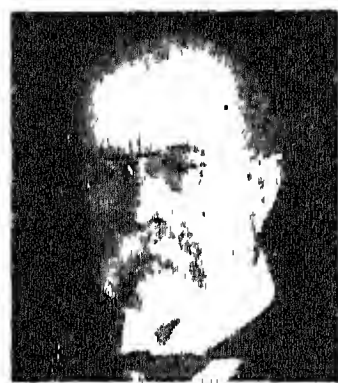
Masai. Negro people, some 200,000 in number, of Nilo-Hamitic affinity in east Africa, noted for their military prowess at the time of European penetration. Their traditions indicate that they probably came from the area to the south of Lake Rudolf. The Masai proper are purely pastoral, though some groups have been forced to take up cultivation; through trade with Bantu they procure necessities that their cattle are unable to provide. Their kinship system stresses agnatic descent, and clans are totemic and patrilineal. The function of the complex ageset system was to provide a permanent warrior force and to instruct in discipline. Marriage is ruled by clan, ageset, and kinship ties.

Masaniello. Name given to the Neapolitan patriot, Tommaso Aniello (1622-47). A fisherman of Amalfi, he became leader of the populace when they rose against the Spanish tyranny in Naples, July 7, 1647. Count d'Arcos, the viceroy, was driven to Castelnuovo, and for six days Masaniello was ruler of the city. He tried to moderate the fury of the mob and restrain their excesses. On July 13, d'Arcos agreed to the demands of the insurgents, and three days later Masaniello was murdered and mutilated by his old adherents. His story forms the theme of Auber's opera, *La Muette de Portici*.

Masaryk, JAN GARRIGUE (1886-1948). The son of Thomas Masaryk, he entered the Czechoslovak foreign service in 1918, and served in the London and Washington embassies before becoming ambassador to Great Britain in 1925. In 1939 he resigned, and in 1940 became foreign minister in the provisional Czechoslovak government which was set up in London. He was deputy prime

minister, 1941-45, during which time he became widely known to British listeners by his broadcasts in the B.B.C. Brains Trust. With the re-establishment of the Czechoslovak republic he became foreign minister, and led his country's delegations to the San Francisco conference of 1945 and to the Paris peace conference; he was retained in his post in the government formed after the Communist *coup d'état*, Feb., 1948. He committed suicide (to all appearances) by throwing himself from a window, March 10.

Masaryk, THOMAS GARRIGUE (1850-1937). Man of letters and first president of the republic of



T. G. Masaryk,
President of
Czechoslovakia

Czechoslovakia. He was born, Mar. 7, 1850, at Hodonín, his father being a Moravian coachman and his mother of mixed Slovak and German descent. He was educated at the Czech school at Czejkovice and the German school at Hustopech, and worked as a locksmith in Vienna and a blacksmith in Moravia. In 1865 he was able to resume his studies, first at Brno, and later at Vienna, where he graduated, and Leipzig. In 1882 he became a professor at Prague university.

He was elected to the Austrian Reichsrath in 1891, but resigned two years later. Re-elected in 1907, he denounced the conduct of Serbo-Croat affairs by the Austrians, especially with regard to Bosnia and Herzegovina. When the First Great War broke out he escaped from Austria to campaign for a free Czechoslovakia, founding with Dr. Benes and General Stefanik the Czechoslovak National Council which in 1918 was recognized as the country's provisional government. In 1915 he took up an appointment at King's College, London, and his writings proved so dangerous to the Austrians that he was condemned to death in his absence, and his property confiscated. He was elected president of the newly-formed Czechoslovak republic, Nov. 14, 1918, and re-elected in 1920, 1927, and 1934; but in Dec., 1935, his failing health induced him to resign. He died Sept. 14, 1937. The whole period of his country's independence drew inspiration from him. He encouraged his compatriots to make their country an observatory from which

to watch developments in all parts of the world. His writings, in Czech and German, include *Blaise Pascal*, 1883; *Slavic Studies*, 1889; *Russia and Europe*, 1913; *The World Revolution*, 1925. His war memoirs appeared in 1925. See *Czechoslovakia. Consult President Masaryk Tells His Story*, recounted by Karel Capek, 1933; *Lives*, D. A. Lowrie, 1930; E. Ludwig, Eng. trans. J. Murphy, 1936; R. J. Kemer, 1938; V. Cohen, 1941; P. Selver, 1941.

Masaya. Town of Nicaragua, capital of the dept. of Masaya. At an alt. of about 3,000 ft., near Lake Masaya, it is 16 m. by rly. S.E. of Managua. The surrounding districts produce tobacco, sugar, coffee, and rice. Pop. 30,372.

Masbate. One of the Philippine Islands. Situated W. of Samar and S. of Luzon, it forms, with the adjacent islands, the province of Masbate, which has an area of 1,260 sq. m. With hills rising to 2,500 ft., it has large forest tracts, producing excellent timber. Agriculture is undeveloped, and stock-raising and fishing are the chief industries. Manufactures include mats and sugar sacking, and a fairly large export trade is carried on from Masbate, the capital, and several other good harbours. It was occupied by the Japanese in April, 1942, and liberated when Japanese opposition in the Philippines ceased early in 1945. Pop. of province, 108,800.

Mascagni, PIETRO (1863-1945). Italian composer. Born at Leghorn, Dec. 7, 1863, the son of a baker, he



Pietro Mascagni,
Italian composer

studied music there and at Milan. In 1890, Mascagni leapt suddenly into fame by the production at Rome of the one-act opera *Cavalleria Rusticana*. This won for him worldwide popularity. In 1895 he was made director of the Conservatoire at Pesaro, and after a tour in the U.S.A. as operatic conductor he became a teacher in Rome. His other operas include *L'Amico Fritz*, 1891; *Iris*, 1898; *Parisina*, 1913; and *Nero*, 1935. He died Aug. 2, 1945.

Mascara. Town of Algeria. At an alt. of 1,834 ft., 93 m. by rly. S.E. of Oran, it has a large trade in wine, oil, and cereals. Mascara was the residence of Abd-el-Kader who, in 1837, preached the holy war of extermination against the Chris-

tians. It was taken by the French under Bugeaud on May 30, 1841. Pop. 31,842. The name mascara is given to eyelash cosmetic.

Mascarene. Collective name for three islands E. of Madagascar, in the Indian Ocean, Mauritius, Réunion, and Rodriguez. Réunion was discovered by the Portuguese Mascarenhas in 1545.

Mas d'Azil. A French hamlet near the Pyrenees, remarkable for the discovery by Édouard Piette in 1887 of mesolithic remains. It has a natural limestone tunnel 450 yds. long. See Azilian.

Masdevallia. Large genus of epiphytal plants of the family Orchidaceae. They are natives of the mountain regions of tropical America. The leaves are long and leathery, and the very striking flowers are borne singly or in pairs at the summit of long, leafless stalks. Sepals form the showy part, the small petals being concealed.

Masefield, JOHN EDWARD (b. 1878). English poet laureate. He was born at Ledbury, June 1,



John Masefield,
English poet laureate

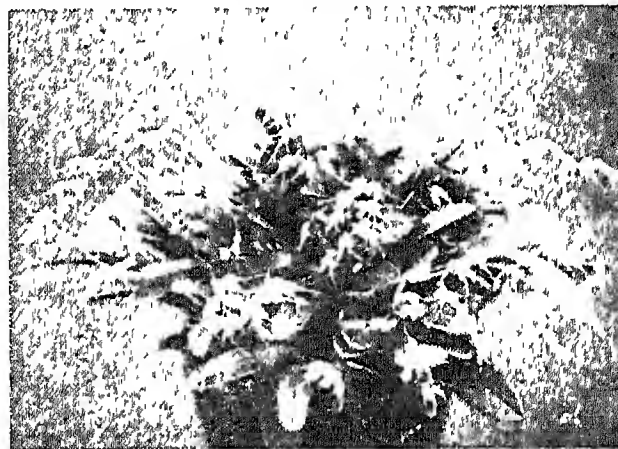
1878, and spent his early years wandering, as a sailor before the mast, and in varied employment in the U.S.A., gaining the hard experience he was later to write about. Salt-water Bal-

lads were published in 1902, *A Mainsail Haul*, 1905, his edition of *Dampier's Voyages* in 1906, and thenceforward he pursued literary work. In the First Great War he served with the Red Cross in France and at the Dardanelles.

Many pieces in the volumes of 1902-05 and in *Ballads and Poems*, 1910, were marked by the bold rhythms of the Kipling school. In 1911 reputation came with the first of his long narrative poems, *The Everlasting Mercy*, recounting in rough-and-ready but original and memorable rhyme the story of a village drunkard's conversion. It was followed by similar works, unequal but vivid in style: *The Widow in the Bye-Street*, *The Daffodil Fields*, and *Dauber*.

Biography, a less known but truly subjective poem, shows Masefield concerned with that ceaseless striving after an ideal beauty which forms the subject of the series of grave and beautiful sonnets in *Lollingdon Downs*,

1917. With *Reynard the Fox*, 1919, and *Right Royal*, 1920, vigorous pictures of sport in the English shires, Masefield resumed his narrative genre. Nearly all the volumes to this date have much about ships and the sea. But in the Second Great War no subject inspired him so much as the women's land army. Collected *Poems* appeared in 1932.



Masdevallia abbreviata. Leaves and flowers of this Peruvian plant

His plays include *The Tragedy of Nan* (in dialect), 1909; *Pompey the Great*, 1910; *Philip the King*, 1914; *Good Friday*, 1916; *The Trial of Jesus*, 1925; *Tristan and Isolt*, 1927. Among novels and adventure stories are *Captain Margaret*, 1908; *Lost Endeavour*, 1910; *Sard Harker*, 1924; *Odtaa*, 1926; *The Bird of Dawning*, 1933; *Dead Ned*, 1938; *New Chum*, 1944. In 1911 came a modest study of Shakespeare. Masefield succeeded Bridges as poet laureate in 1930 and was awarded the O.M. in 1935. *So Long to Learn* (autobiography) appeared in 1952.

Alan Phillips

Maseru. District and capital town of Basutoland, S. Africa. The town has a mission station, with industrial school and hospital. Near the Caledon river, it is 80 M. E. by S. of Bloemfontein.

Masham. A rural dist. and market town of the N. Riding of Yorkshire, England, on the Ure, 8 m. N.W. of Ripon. The church of S. Mary the Virgin is partly Norman. There is a grammar school founded in the 18th century; the chief industries are a trade in agricultural produce, and brewing. Market day, Wed. Pop. (1951) rural dist., 1,738. *Pron.* mas-hm.

Masham, SAMUEL CUNLIFFE-LISTER, 1ST BARON (1815-1906). British inventor and manufacturer. The son of a Yorkshire squire, Ellis Cunliffe, afterwards Cunliffe-Lister-Kay, he was born at Calverley Hall, near Bradford, Jan. 1, 1815. He began business in Liverpool, afterwards setting up a worsted mill at Manningham with his brother, and later was

associated with Isaac Holden. He perfected a compressed air brake for rlys., a silk-combing machine, a velvet loom, and a method of utilising silk waste. In 1891 he was made a baron, and he died Feb. 2, 1906. At one time possessed of great wealth, he bought Swinton Park, Jervaulx Abbey, and extensive estates in the West Riding. He was a strong tariff reformer. *Pron.* Mass-ham.

Masham, ABIGAIL (d. 1734). English courtier. The daughter of Francis Hill, a London merchant, she was appointed woman of the bedchamber to Queen Anne, through the influence of her cousin, the duchess of Marlborough. In 1707 she privately married Samuel Masham, who was then in attendance on Prince George of Denmark, and was raised to the peerage in 1712 as Baron Masham. The duchess soon found that her cousin was supplanting her in the queen's favour and was assisting her enemy Harley. In the quarrel that ensued Mrs. Masham was victorious, and her power increased. She was driven into retirement with her husband by Anne's death in 1714. She died Dec. 6, 1734.

Mashhad. See Meshed.

Mashie. Golfer's iron club, intermediate in length of shaft and loft of face between the iron and niblick. Its main purpose is for comparatively short approaches, so played that the ball will stop on the green near the pin.

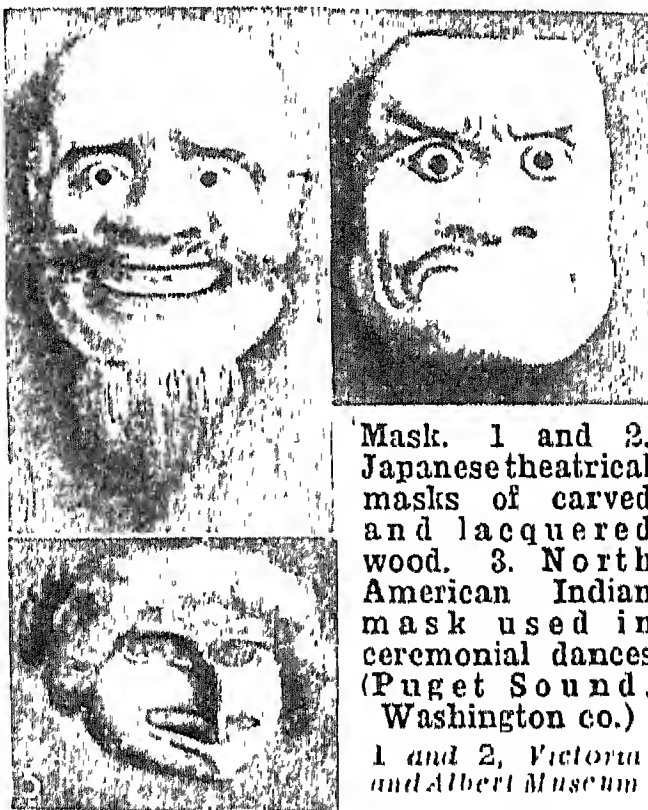
Mashonaland. District of S. Africa, now part of Rhodesia. It is named after the Mashonas. Lying to the N.E. of Matabeleland, it is a mountainous area, but is rich in minerals, gold having been mined here in ancient times, and contains excellent pasture land. Salisbury is the chief town; others are Hartley, Gatooma, Umtali, and Victoria. Mashonaland was included in the grant made in 1889 to the British South Africa Co., and in 1890 a force was sent to take possession of it. In 1893 the inroads of the warlike Matabele, long the enemies of the more peaceful Mashonas, led to the Matabele War. In 1896 the Mashonas rebelled, and for over a year the rising continued, but in the end it was put down, and Mashonaland became soon an integral part of Rhodesia. See British S. Africa Co.; Matabeleland; Rhodesia.

Masinissa (c. 238-148 B.C.). Numidian king. Son of the king of the Massylians, or E. Numidians, he was educated at Carthage, and

in the second Punic war at first fought for the Carthaginians, but after their defeat deserted to the Romans. He was hard pressed both by the Carthaginians and by another Numidian king, Syphax, but the arrival of Scipio in Africa in 204 B.C. brought relief, and Masinissa was able to play an important part in the battle of Zama, 202, in which the Carthaginians were completely defeated. As a reward for his services to the Roman cause, he received the territory of Syphax, and thus became king of all Numidia. See Sophonisba.

Mask (Fr. *masque*, *vizor*). A covering for the face, assumed either to conceal the features or to represent a character. The hideous masks ceremonially used by many savage peoples are intended to ward off demons, to express totemistic ideas, and to terrify enemies. The faces of the dead were masked by the ancient Egyptians, Mycenaean Greeks, Mexicans, and Peruvians, to preserve them from molestation by evil spirits. In the presentation of the Greek drama every actor wore a mask suited to the character he personified. They were made of bronze or copper, enamelled or painted, and designed to add power to the voice so that the actor could be heard at the farthest limit of the vast theatre. This was effected by fastening the mask to the head with a kind of periwig, which covered the head and left only a circular passage for the voice to sound through, whence was derived the Latin word for a mask, *persona* (*personare*, to sound through).

On the modern stage masks have been discarded by actors with speaking parts, the smaller stage requiring the use of facial expression and of vocal asides, which would have been lost in the immense auditorium of a classic Greek theatre. But masks, especially of grotesque design and representing heads of animals, still figure prominently in pantomime. In Shakespeare's time ladies commonly wore black masks to conceal their identity in public, perhaps always did this in the theatre. Hence, as Nares points out, if a theatrical company had no male actor physically well adapted to impersonate a woman, he could don a mask and yet not be absurdly out of the picture. Thus, in *A Midsummer Night's Dream*, when Flute begs not to play a woman since he has a beard coming, Quince retorts "That's all one: you shall play it in a mask, and you may speak as small as you will."



Mask. 1 and 2. Japanese theatrical masks of carved and lacquered wood. 3. North American Indian mask used in ceremonial dances (Puget Sound, Washington co.)
1 and 2, Victoria and Albert Museum

In sculpture the word mask is used in several connexions, such as a representation of the human face, whether noble or grotesque, in gargoyles, on tiles fixed at the ends of cornices and eaves, or on the keystone of an arch, and as a cast of a face taken after death, technically a death-mask.

For protective purposes masks have been developed into various forms, e.g. the inhalers used by firemen, miners, and divers when working in smoke or vitiated air or under water, and the gas respirators worn by troops assailed with poisonous fumes. The word mask is also applied by military engineers to a screen provided for a battery, and to earthworks thrown up to protect men when constructing a battery. See *illus. to Actor*; *Comedy*; *Harlequin*; *Masque*; *Masquerade*; *Respirator*.

Mask. Lough of Ireland. It is on the borders of Galway and Mayo, and contains about 20 islands. It is 12 m. long, 2 to 4 m. broad. Salmon and trout are caught. On the S.E. shore are the ruins of a castle, built in the 13th century and restored by Sir Thomas Bourke in the 17th.

Maskell, DANIEL (b. 1908). British lawn-tennis player. He was born in London, April 11, 1908, and on leaving school was attached as a professional to Queen's Club, London. In 1926 he won the British professional lawn tennis championship, and between that year and 1949 won that title 15 times. In 1927 he won the open professional world championship. He was official coach to the All-England club for 26 years until appointed in 1955 first training manager of the L.T.A.

Maskelyne, JOHN NEVIL (1839-1917). British entertainer and illusionist. Born at Cheltenham, Dec. 22, 1839, he was apprenticed to a

watchmaker, but studied conjuring and began entertaining at the age of 16. In 1865 he entered into partnership with one Cooke, exposed the mysteries of the Davenport spiritualistic quacks, and in 1873 moved to London. The partnership, later Maskelyne and Devant, took the Egyptian Hall, Piccadilly, and The Hall of Magic was the scene of ingenious illusions until they moved to St. George's Hall in 1905. Maskelyne died May 18, 1917. An unwavering opponent of frauds perpetrated under the guise of spiritualism, he was never deceived by any pretended medium, whilst the secrets of many of his tricks remain undiscovered.

Maskelyne, NEVIL (1732-1811). British astronomer. Born Oct. 6, 1732, he was educated at Westminster and Cambridge. In 1761 he observed the transit of Venus from St. Helena on behalf of the Royal Society. He was appointed the astronomer royal, 1765, and founded the Nautical Almanac the following year. During his long tenure at Greenwich he also compiled a valuable catalogue of fundamental stars, and introduced systematic publication of results noted at the observatory. He died Feb. 9, 1811.



Nevil Maskelyne,
British astronomer
After Vanderburgh

Masks and Faces. Comedy by Charles Reade and Tom Taylor, founded on the former's novel *Peg Woffington*. Produced Nov. 20, 1852, at The Haymarket, it had a successful run, Mrs. Stirling playing Peg Woffington, Leigh Murray Sir Charles Pomander, and Benjamin Webster Triplet.

Masochism. Term in psychology used to denote the converse of sadism (*q.v.*). The word derives from Leopold von Sacher-Masoch, an Austrian novelist, who described the condition.

Mason. Worker in building stone. The term is usually applied to artificers who dress or hew blocks of stone into sizes and shapes suitable for building, but it includes those who place the stones in position and erect the buildings. From earliest times the mason's was one of the most important and exclusive crafts. In the Middle Ages expert masons travelled from town to town over Europe. The term is also used for freemason. See *Freemasonry*.

Mason, ALFRED EDWARD WOODLEY (1865-1948). British novelist. Born May 7, 1865, he



A. E. W. Mason,
British novelist

was educated at Dulwich and Trinity College, Oxford. During 1906-10 he was Liberal M.P. for Coventry. His first literary success was *The Courtship of Morrice Buckler*, 1896; it was followed by a series of books which showed the power to impart movement to a story. This enabled him to achieve success in a series of crime novels, featuring a French detective, Hanaud. Outstanding among his writings were *The Four Feathers*, 1902; *The Broken Road*, 1907; *At The Villa Rose*, 1910; *The Turnstile*, 1912; *The House of the Arrow*, 1924; *The Sapphire*, 1933; *Fire over England*, 1936; *Konigsmark*, 1938. Several of these were dramatised and filmed, and Mason also wrote original plays, including *The Witness for the Defence*, 1911; *Running Water*, 1922; and a film script, *The Drum*, 1937. In 1941 he published an idealised life of Drake. Mason died Nov. 22, 1948. *Consult* Life, R. L. Green, 1952.

Mason, JAMES (b. 1909). British-born U.S. actor. Born at Huddersfield, May 15, 1909, he was educated at Marlborough and Peterhouse, Cambridge. After practising as an architect in Manchester, he joined a repertory company, making his first professional appearance at Aldershot in 1931. In 1933 he appeared in *Gallows Glorious* at the Shaftesbury Theatre, London; he played at the Old Vic 1933-34, the Gate Theatre, Dublin, 1934-35. He entered films in *Late Extra*, 1935, but did not make an outstanding reputation until 1939 in *I Met a Murderer*. On the strength of saturnine performances in *Thunder Rock*, *The Man in Grey*, *Fanny by Gaslight*, and *The Seventh Veil*, he was voted the most popular British film actor in the Daily Mail poll of 1945. His later film successes included rôles in *The Wicked Lady*, *Odd Man Out*, *The Upright*



James Mason,
British-born U.S.
actor

Glass, *The Reckless Moment*, *Rommel—Desert Fox*, *Julius Caesar*, *A Star is Born*. In 1946 he went to the U.S.A., taking out papers for U.S. citizenship 1954.

Mason, SIR JOSIAH (1795-1881). British manufacturer and philanthropist, born Feb. 23, 1795, at Kidderminster. In 1825, having gained some experience in a Birmingham factory, he bought a small business and became a manufacturer of hardware, soon devoting himself mainly to making pens, in which he built up a large business. The pens bore the name of James Perry, the London stationer who placed them on the market. Mason became interested



Sir Josiah Mason,
British
philanthropist

in other industries in Birmingham, especially electroplating. In 1872 he was knighted. He founded in 1880 the Mason Science College at Birmingham (out of which in 1900 developed the University of Birmingham), and also an orphanage at Erdington. He died June 16, 1881.

Mason and Dixon's Line. Originally, the boundary between the states of Pennsylvania and Maryland, U.S.A. It was drawn 1763-67 by two English astronomers, Charles Mason (1730-87) and Jeremiah Dixon (d. 1777) to settle a century-old dispute between the two states, and was marked by stones, those at every fifth mile bearing on one side the arms of Lord Baltimore and on the other those of Penn; a number of these stones remain. After the Missouri Compromise (*q.v.*) of 1820 the name Mason and Dixon's Line was popularly extended to the boundary dividing slave from free states and territories of the U.S.A.

Mason City. City of Iowa, U.S.A., the co. seat of Cerro Gordo co. It stands on a small stream, 70 m. N.E. of Fort Dodge, and is a rly. junction. Settled in 1853, it was incorporated in 1870 and made a city in 1881. It produces 5 p.c. of the nation's cement, has brick and tile works, makes clay ware, and has meat processing plants, also a small trade in agricultural produce. Pop. (1950) 27,980.

Masonry. The art of shaping or building in stone and similar materials. It is an ancient craft and method of construction, stone being one of the first materials

used for building. It is not possible to give the date of the first masonry structure, but it is quite easy to believe that prehistoric cave-dwellers adjusted the positions of loose blocks at the entrances to their home to give added protection against the weather, their enemies, and the animals they had dispossessed.

Some of the finest examples of the masons' art in existence today are the work of the Greeks. The earlier works of the Egyptians were of a very high quality too, but it is the magnitude of the tasks they undertook rather than the quality of their actual craftsmanship that is impressive. The building of the pyramids, which are constructed of large blocks of granite faced on the outside with slabs of polished alabaster, was a task which today would be considered to require the aid of mechanical transport, high grade cutting tools, and carborundum and diamond saws.

Masonry in the British Isles had not got far beyond the cave-dwelling stage before the coming of the Romans, and although these early invaders are chiefly famed for their road building, they were responsible also for many structures and founded a number of British towns. After their departure in A.D. 410, the buildings suffered during the troubled times that followed. The work of the Anglo-Saxon masons, though crude, showed the influence of the Romans, and much of the material from Roman buildings which had been destroyed or had gone into decay was used again.

The Normans brought with them in the 11th century new ideas from the Continent, their own craftsmen, and sometimes their own materials: several English cathedrals contain Norman work constructed in stone from the quarries of Caen in Normandy.

From the 12th to the 15th century the development of masonry and of English architecture can be most easily traced through ecclesiastical buildings. Changing conditions of life and historic events are reflected in these buildings; new ideas, new tools, and new methods of construction helped to determine the style of architecture.

Norman masonry can be divided into two almost distinct periods. The earlier examples retain much of the crudeness of Saxon work: wide joints between blocks, shallow mouldings, typical

of the work of the axe and not the chisel. The use of the chisel brought about an almost sudden change in the quality of craftsmanship, and some examples, *e.g.* at Canterbury and Winchester, show a line of demarcation so clear that the period of the work can be traced almost to a stone.

The Early English period, approx. the 13th cent., shows a steady development of craft skill both in the finishing of the blocks themselves and in construction. Deeply cut mouldings, clustered columns surmounted by carved foliated capitals, thinner walls with larger and more scientifically de-

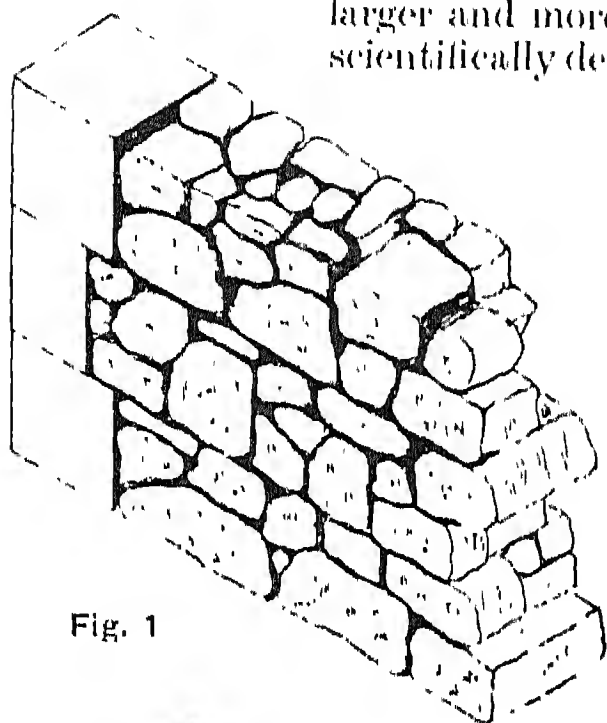


Fig. 1

Masonry in the Perpendicular style is more subdued, considered to be a reflection on the Black Death which terminated the Decorated period. Mouldings were shallow, mullions were carried vertically through the tracery of the windows and the geometrical patterns became simple sub-division of the bars.

Many great masonry structures have been erected since the end of the Gothic period, *e.g.* works by Wren, Nash, Barry, and Pugin. Liverpool cathedral is an example of 20th cent. masonry; started in 1904, this great building was still far from complete when work on it was interrupted by the Second Great War.

Masonry tends to become a series of specialised trades, each with its own specialised crafts-

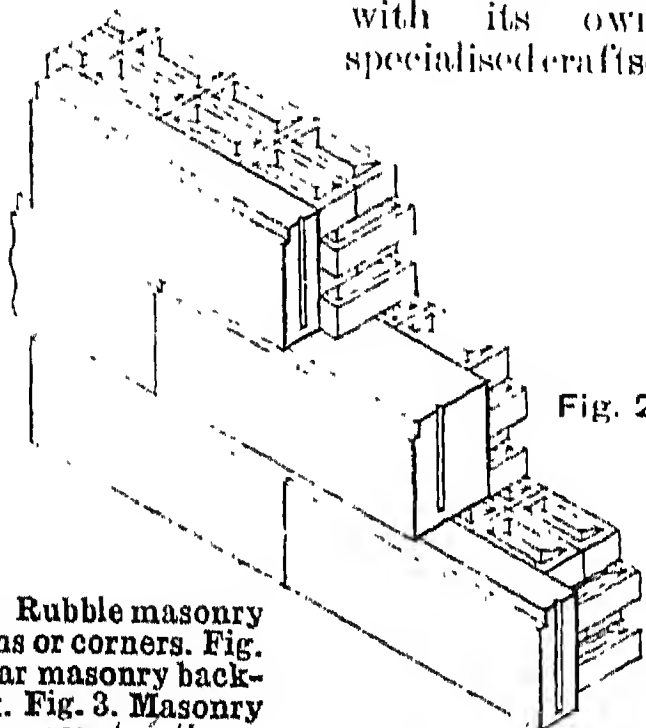


Fig. 2

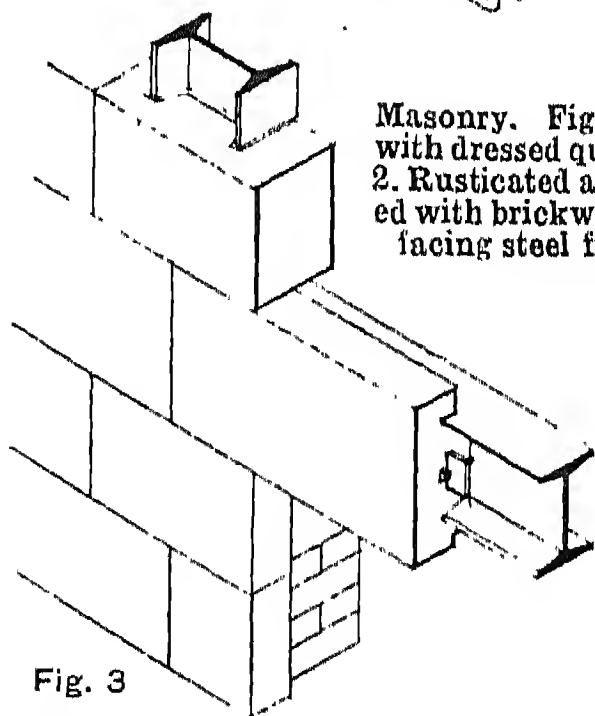


Fig. 3

Masonry. Fig. 1. Rubble masonry with dressed quoins or corners. Fig. 2. Rusticated ashlar masonry backed with brickwork. Fig. 3. Masonry facing steel frame construction

signed buttresses are typical. Ribbed vaulting was introduced and developed, tracery in windows, which began as simple piercings, became ultimately separations of the mullions.

The growth of the Decorated style, which covers approx. the 14th cent., was gradual. This period includes the most perfect and complete examples of Gothic masonry. The mouldings consisted chiefly of rounds and hollows separated by fillets, many of the members being decorated by the familiar bell flower. Much of the tracery of the windows, an outstanding feature of the period, was geometrical in construction and varied considerably in design.

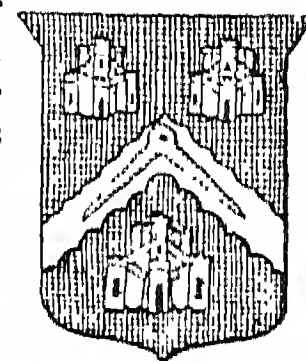
men. It can be divided according to the material—granite masonry, marble, hardstone, softstone, etc., and also according to the type of construction, *e.g.* rubble masonry, where the blocks are unwrought and are laid and bonded in the natural state just as they were obtained from the quarry; wrought or dressed masonry, where the blocks are accurately cut and dressed to a specific shape and size; monumental masonry, the working and erection of monuments.

The processes necessary to convert a piece of stone into a portion of a masonry structure vary according to the type of stone and structure. Generally the material is either wedged or blasted from its quarry bed and transported in blocks to the mason's yard. The rough blocks are cut to approx. sizes either by diamond-studded or carborundum-rimmed circular saws, or by the older method of abrasion with swinging steel blades fed with sand, steel shot, and water.

The design and required shape of the stone is transferred to zinc moulds from which the banker mason shapes the block with the aid of chisels and a mallet. Plain blocks and straight lengths of moulding can be worked entirely by machine. Each block is carefully checked for size and numbered before it is fixed, the term used for the actual setting of the stone in the wall.

T. B. Nichols

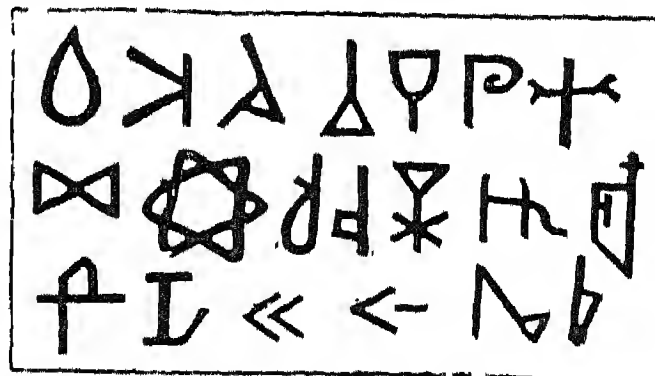
Masons' Company. London city livery company. Its first by-laws were drawn up in 1356, and its initial charter was granted in 1677. The site of the company's old hall in Basinghall Street was later covered by Masons' Hall Tavern. The offices are at 9, New Square, Lincoln's Inn, London, W.C. Consult *The Hole Crafte and Fellowship of Masons*, E. Conder, 1894.



Masons' Company arms

Masons' Marks. Figures scratched or cut into the stones of ancient buildings in various parts of the world. Attention was first formally directed to them by George Godwin, in a communication to the Archaeological Association in 1841. Masons' marks assume innumerable forms, which may be roughly classed as geometrical, symbolical, heraldic, pictorial, and alphabetical. Some of these are of universal occurrence, *e.g.* the fylfot, or Thor's hammer, which is found in India and at Alnwick Castle, while a symbol in a chamber of the Great Pyramid is identical with one cut in a wall at S. Mary's, Leicester.

In attempting to account for the marks, opinion is sharply divided. Some see in them secret signs of mystic brotherhoods, or guilds of travelling masons, such as the Comacines, or masonic fraternity of Como; others take the view that they were tally marks to associate the mason with his work, and thus fix responsibility for quantity and quality. Masons'



Masons' Marks. Examples from the cathedral of Pierrefonds, France, 14th century

marks, sometimes called bankers' marks, a mason who worked at a bench or bank being a banker, are especially prevalent in medieval times. The records of the Brechin Lodge of Masons show that each member was given a symbol, which passed from father to son.

Maspero, GASTON CAMILLE CHARLES (1846-1916). A French Egyptologist. Born in Paris, June 23, 1846, he became professor of Egyptology there, 1869. In 1880 he went to Egypt to succeed Mariette as director-general of the antiquities service. In 1881 he made the remarkable discovery of a cache of royal mummies at Deir el-Bahri. From then until his retirement in 1914 he laboured to build up the antiquities service and the great collection housed in the national museum. His works, many of which were translated into English, included *L'Archéologie égyptienne*, 1887; *Études égyptiennes*, 1879 onwards; and his great *Histoire ancienne des peuples de l'Orient classique*, 1894-96. Maspero was made an honorary K.C.M.G. in 1909, and died in Paris, June 30, 1916.

Masque (Fr., mask). Theatrical entertainment of an allegorical nature, usually written for a particular occasion, and distinguished chiefly by the splendour of the spectacular effects provided by machinist, scene painter, and costumier, to embellish the poetical conceits of the author. In the prologue to his own masque *The World Tost at Tennis*, Thomas Middleton defines the form, not calling the device a play, because it breaks the stage's laws of acts and scenes; it lays claim neither to comedy nor tragedy, nor yet to history, though presenting something of all; "it was intended for a royal night: there's one hour's words, the rest in songs and dances."

As a fashionable amusement in England the masque, introduced, it is said, from Italy in 1512, had its greatest vogue in the time of James I and Charles I. Ben Jonson was the author of many masques, pageants, and court entertainments, and reveals his poetic genius at its best in the delicacy of the craftsmanship and the light playfulness of the lyrics. The most beautiful example is Milton's *Comus*, presented at Ludlow Castle on Michaelmas night, 1634.

The Inns of Court provided many poets with opportunity to give their fancy rein in this direction, and lavished money upon the magnificent production of

masques. One by Chapman, for which Inigo Jones provided the machinery, cost the society of Lincoln's Inn £1,086 8s. 11d. to present before King James and his consort on the occasion of the marriage of the Princess Elizabeth to the Elector Palatine of the Rhine. For the same occasion Beaumont wrote a masque presented by the Inner Temple and Gray's Inn before the king and queen in the banqueting house, Whitehall. In the opinion of some judges the finest composition of the kind, with the exception of *Comus*, was *The Inner Temple Masque* of William Browne (1590-1645), author of *Britannia's Pastorals*. Others that may be mentioned are the *Microcosmus* of Thomas Nabbes, *The Triumph of Time*, a moral masque forming the last part of a curious composition called *Four Plays in One* by Beaumont and Fletcher, and *The Mountebank's Masque*, produced at court in 1618, included in John Marston's works by A. H. Bullen.

The composers of the 17th cent. contributed a good deal to this form of dramatic entertainment. Among them were Alfonso Ferrabosco, who wrote the music for Ben Jonson's *The Masque of Blackness*, *Hymenaei*, *The Masque of Beauty*, and *The Masque of Queens*. Thomas Campion wrote several masques, including *The Masque of Flowers*, for Gray's Inn; and sundry songs in other masques. The song *Rule Britannia* appeared in its original form in the masque of Alfred, 1740, by Thomson and Mallet, with music by T. A. Arne. Consult *English Masques*, ed. H. A. Evans, 1897; *List of Masques, Pageants, etc.*, W. W. Greg, 1902.

Masquerade. Form of revel in which the company wear masks. In the 13th century the masquerade was a highly popular amusement in England, not only among the lower classes, for whom the mummers provided crude fun at seasons of mirth and jollity, but also among the feudal lords and at the court. Edward III was particularly fond of this sort of entertainment, and an extant list of the masks and "visers" used at his Christmas revels in 1347, the year before the Black Death, mentions lions' and elephants' heads, men's heads with bats' wings, satyrs, and virgins. Both Pepys and Evelyn mention a masquerade held at Whitehall, Feb. 2, 1665, and at the beginning of the 18th century this form of

revel became such a craze in London that it was denounced by moralists and satirists, and by the clergy from the pulpits. They survive in the festivities of carnival (*q.v.*), and the fancy dress ball.

Mass. Property of all material objects. For many purposes it can be thought of as representing the "amount of matter" in a body. In Newtonian mechanics it is closely associated with inertia, the apparent reluctance of a body to change its speed or direction of motion. Two bodies are said to have equal mass when under the influence of the same force they show the same amount of acceleration. Thus masses can be compared, or measured in terms of a standard mass, by weighing—*i.e.* by comparing the effect on each of the earth's gravitation. For this reason the units of mass have the same names as the units of weight—gram, pound, etc.

The principle called the conservation of mass or matter was enunciated by Empedocles (490-430 B.C.) in the form: "Nothing can be made out of nothing and it is impossible to annihilate anything." In modern times it was first explicitly stated by Lavoisier in 1789, but it had been assumed earlier, and has remained ever since the guiding principle of quantitative chemistry.

In 1905 the publication of the *Special Theory of Relativity* led to a reconsideration of the Newtonian concept of mass. The measurement of any given mass was now held to depend on the relative speed of the observer; the relation being given by the Lorentz transformation

$$m = \frac{m_0}{\sqrt{1 - v^2/c^2}}$$

Where m_0 is the proper mass (*i.e.* the mass measured by an observer not moving relative to the body); v is the actual velocity of the observer relative to the body (and vice versa) and c is the speed of light. By assuming an equivalence between mass and energy represented by $E = mc^2$, it was possible to replace the old rules of separate conservation of mass and energy by a combined principle of the conservation of mass plus energy. The implied suggestion that in some circumstances mass might turn into energy and vice versa (a very small mass yielding a very large amount of energy) has since been amply confirmed in atomic physics.

Mass (Lat. *missa*, dismissed). Roman Catholic name for the Eucharist. The origin of the word

is much disputed, but Mass appears to have been used in its present sense from the 6th century, the "dismissal" being first that of the catechumens after the sermon, and then that of the baptized at the close of the service. The word was sometimes used for services other than that of the Eucharist. The term was retained in the first vernacular liturgy of the Church of England, 1549, where the title ran, The Supper of the Lord, and the Holy Communion, commonly called the Mass, but was omitted in the revised book of 1552.

The Roman Catholic Mass is based on the belief that Christ died once for all as a victim for man's sins and can die no more, though He stands for ever before the throne of heaven as "a lamb as it had been slain" (Rev. 5, v. 6). In the Mass by Transubstantiation (*q.v.*) the heavenly victim is believed to be present on the altar and is offered, by the ministry of the priest, as a sacrifice of adoration, praise, thanksgiving, and propitiation. The efficacy of the Mass derives from Christ's one sacrifice and adds nothing to its fruits, though it can distribute them. The Church benefits in the fruits of every Mass, but a special share goes to those present, to those whose intention the priest celebrates, and to the priest himself. High Mass (*Missa solennis*) is celebrated with the assistance of deacon and subdeacon, and is sung. Low Mass (*Missa bassa* or *lecta*) is recited by the priest without music and with one server. The Mass for the dead is called a Requiem, from the opening word of the Introit.

See Communion, Holy; Eucharist; Last Supper; Requiem; Vestments.

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Mass, MUSIC OF THE. From earliest centuries in the history of the Christian Church some form of singing has been used varying from monotone with slight inflections, through inflected monotone of a more elaborate type, to the polyphonic music of the 15th and later centuries. The portions of

the Mass chiefly chosen for musical treatment were the Kyrie, Gloria, Credo, Sanctus, Benedictus, and Agnus Dei.

In these polyphonic settings a plainsong melody was chosen and other voice parts were woven around it, in number from 2 to 12, and even more; sometimes the melody was a secular one, and this led to levity when irreverent choirmen substituted the original words of a love song or drinking song for the Latin words of the Mass. Occasionally a composer provided his own *canto fermo*, and treated it in the same way by the addition of cleverly interwoven vocal parts. Composers of the polyphonic Mass, whose names may be used as links for further reference, include Dufay, Dunstable, Binchois, Morales, Van Rore, Goudimel, Willaert, Palestrina, Vittoria, Gabrieli, Orlando Lassus, William Byrd, and Gregorio Allegri, with whom the polyphonic school virtually died out in the middle of the 17th century.

In the 18th and early 19th centuries musical landmarks are the Masses of Bach, and the beautiful but not strictly ecclesiastical works of composers of the Italian and Viennese schools, including Haydn, Mozart, and Schubert. Beethoven's Mass in D, 1823, may be reckoned the culmination of this type. During the later part of the 19th century and continuing into the 20th, there was a steady revival of interest in polyphonic music, and reprints of the finest examples have been made, helping to redeem the cult of this music from the antiquarian atmosphere that had come to surround it.

Massa. City of Italy, capital of Massa-Carrara prov. It stands near the Gulf of Genoa, 20 m. S.E. of Spezia. It has a light railway to its port, Marina di Massa, or San Giuseppe, whence is shipped the famous white marble. The ducal palace, built in 1701, and now the prefecture, was a residence of Napoleon's sister Marianne Elise, duchess of Lucca. Products include tobacco, olive oil, paper, silk and cotton goods. Pop. (1951) 50,043.

Massa-Carrara. Province of N.W. Italy, in Tuscany. It has a short coastline on the Gulf of Genoa, and a ridge of the Apennines in the N.E. Mostly hilly, it is famous for its marble. Area 688 sq. m. Pop. (1951) 196,806.

Massachusetts. State of the U.S.A. In New England, it is one of the 13 original states of the Union. Its area is 8,257 sq. m., in which are included the islands of

Nantucket and Martha's Vineyard. It has an irregular coastline, which, broken by Cape Cod, Massachusetts, and Buzzard's Bays, and lesser openings, including Plymouth Bay, is 300 m. long. The Cape Cod peninsula is a curiously shaped extension. The surface rises from the low coastal plain to heights of over 3,500 ft. The chief rivers are the Merrimac, Connecticut, Housatonic, Hoosa, Concord, and Charles, and the state has a number of lakes, its inland water area being 390 sq. m. The soil is in parts unfertile; hay, potatoes, and maize are the chief crops. Tobacco is grown, and much land is under fruit. Fishing is an important industry. Boston is the capital. Other large towns are Worcester, Fall River, Lowell, Cambridge, New Bedford, Lynn, Springfield, Lawrence, and Somerville. Gloucester is a fishing centre. Harvard is in the state, as are many places associated with New England's early days. It sends two senators and 14 representatives to congress. Its local affairs are managed by a general court of two houses.

The Commonwealth of Massachusetts, as it is still called, owes its origin to the Pilgrim Fathers who landed near Cape Cod in 1620. In 1620 they secured from the king of England possession of the land around their first home, named this Plymouth colony, and made other settlements in it. About this time, another band of settlers, led by John Endicott, having obtained a grant of land, arrived and formed a settlement N. of Plymouth, the two being independent. This was ruled by the governor and company of the Massachusetts Bay, and had a constitution defined by charter. Both colonies were strengthened by the arrival of Puritans from England during the reign of Charles I.

The Massachusetts Bay colony was the parent of Rhode Island and Connecticut, which broke from it owing to differences of opinion about ecclesiastical matters. Compensation was found, however, by taking possession of New Hampshire and Maine. In the time of Charles II there was trouble between the colonists and the crown, and in 1684 the charter was taken away. A new charter was given in 1692, the two colonies, Massachusetts and Plymouth, being united, and Maine being also included in the enlarged colony. The richest and most populous of the New England colonies, Massachusetts took a leading part in the

wars of the 18th century against France, as her citizens did in the struggle for independence, although even here there were many loyalists. Its present boundary dates from 1820, when Maine became a separate state, New Hampshire having been cut away before the declaration of independence.

In the modern state the struggle for political power lies between voters of Anglo-Saxon origin, usually Republicans, and descendants of Irish immigrants, usually Democrats. There was a large Irish influx in the 19th cent., and in 1948 Boston voters were 75 per cent. R.C. Puritan tradition is still strong, however, in small towns and rural areas. The Congregational church was not disestablished until 1830. Administration is de-

centralised to an unusual extent; there are 40 separate municipalities within 15 m. of Boston. Harvard university has made proposals to correct this decentralisation. Population (1950) 4,690,514.

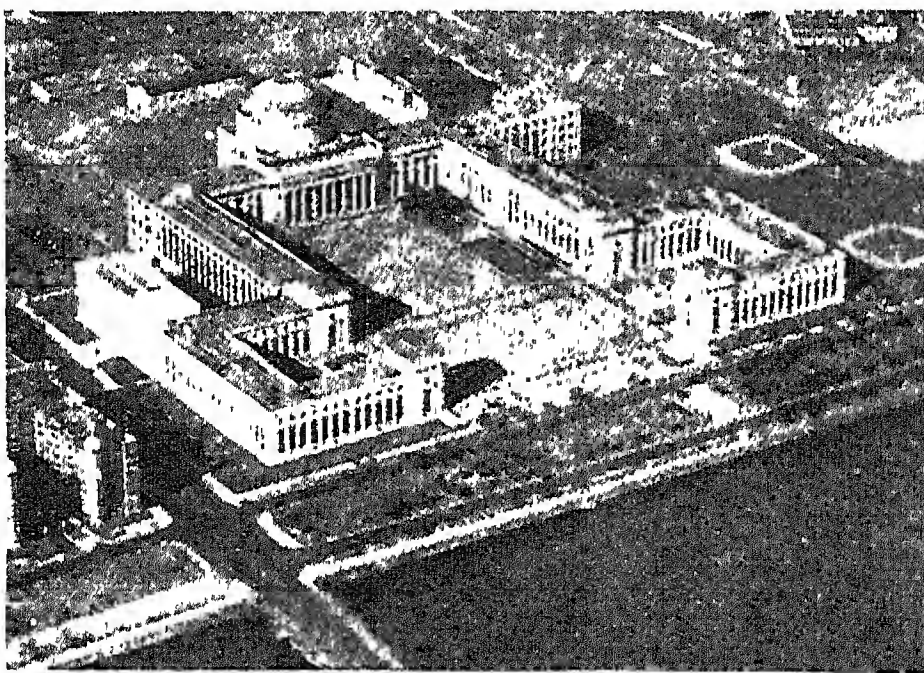
Massachusetts Bay. Broad inlet of Massachusetts, U.S.A. On the E. coast and roughly triangular in shape, it has shores marked by many small openings and fringed by several islands. It extends inland for some 50 m.

Massachusetts Bay Colony. One of the earliest English settlements in N. America. In 1628 a company of merchants from Dorchester obtained from the council of New England a patent for a strip of land along the coast from 3 m. S. of the Charles River to 3 m. N. of the Merrimac, and extending from the Atlantic westward "to the South Sea." In 1629 a royal charter was granted to "the governor and company of Massachusetts Bay." By this charter a group of traders was turned into a political organization. The administration was entrusted to a governor, deputy governor, and 18 assistants, all elected by the whole body of freemen, who, together with these officers, were to meet four times a year in a general court.

Dissatisfaction with the repressive religious policy of the English government was not the least

powerful motive of the successive migrations that established the settlement, notably those led by John Endicott and John Winthrop. In 1631 the general court enacted that none but a member of the Church should have the right of voting, thus realizing the theocratic ideal. The founders of this colony were puritans of the Church of England, unlike those of the Plymouth colony, founded nine years earlier, who were independent separatists. Later, Congregationalism became the religion of the colony. The original charter was forfeited in 1684, but a second, uniting Massachusetts Bay with Plymouth, was granted in 1692.

Massachusetts Institute of Technology. American institution for technical education. Situ-



Massachusetts Institute of Technology. The buildings in Cambridge, Mass., to which the institute was moved from Boston in 1915

ated in Cambridge, Mass., it was founded in 1861, and has more than 800 professors and instructors, and an average student body of about 5,000. The library contains over 250,000 volumes. The institute moved from Boston to its present 80-acre site in 1915.

Massacre of the Innocents. Name given to the killing, by order of King Herod, of all children of the age of two and under in Bethlehem and the surrounding country. Herod hoped by this measure to ensure the death of the child born to be king of the Jews, of whom he had been told by the wise men from the east. Warned by an angel in a dream, Joseph saved Jesus by taking Him and His Mother into Egypt (Matthew 2, vv. 16-18). See Innocents' Day.

Massage. For details of this method of dealing with various bodily conditions, see Physiotherapy.

Massa Marittima. City of Italy, in the prov. of Grosseto. It stands on a hill at an alt. of 1,415

ft., 16 m. by rly. N.E. of Pollonica. It has a 13th century cathedral, a museum of antiquities, and a library. In the vicinity there are mines of iron, lead, copper, zinc, and lignite, and mineral springs. The town suffered only slight damage in the Second Great War, although the Germans in the neighbourhood put up a strong resistance to the advance of the Allies. There was a night tank battle near by, June 24-25, 1944.

Massawa, MASSOWAH, OR MASSAUA. Town on a small coral island in the Red Sea. It is off the coast of the Abyssinian autonomous region of Eritrea, of which it forms the chief port, and is joined to the coast by a causeway nearly a mile long. Massawa was occupied by Italy in 1885. It is the centre of a pearl-fishing industry and of a trade in palm-nuts. A rly. runs to Asmara. Massawa is one of the hottest inhabited places in the world, mean temperature in May reaching nearly 100° F.

In the East Africa campaign, 1940-41, Massawa was captured by British Imperial forces on April 8, 1941, the Italians thereby losing their last port on the Red Sea. Pop. 17,000.

Massawippi. Lake and river of Quebec, Canada. The lake is situated 75 m. E.S.E. of Montreal, measures 9 m. by 3 m., and is a tourist resort. The river joins the lake with the St. Francis river at Lennoxville.

Masséna, ANDRÉ (1758-1817). A French soldier. Born at Nice, May 6, 1758, he served first in the Sardinian army. Joining the forces of the French Republic, he gained rapid promotion and became a general in Dec., 1793. He made a reputation in Italy, especially at Rivoli, Jan. 14, 1797, by his defeat of Korsakow at Zürich, Sept. 26, 1799, and by his defence of Genoa in 1800. Appointed a marshal in 1804, he rendered brilliant services in the Wagram campaign of 1809, and was created duke of Rivoli and prince of Essling by Napoleon.

In 1810 he was given the command against Wellington in the Peninsular War. The British general, after checking him at Busaco, Sept. 27, fell back upon Torres Vedras, and all Masséna's efforts to pierce the entrenchments



(Masséna)

were in vain. After five months he began, in March, 1811, a skilfully conducted retirement, but on May 5 he was defeated by Wellington at Fuentes d'Onoro, and with this his military career practically terminated, since Napoleon, attributing his failure to mismanagement, superseded him. On Napoleon's abdication, April, 1814, Masséna gave his adherence to the restored Bourbon dynasty and refused to join Napoleon on his reappearance in 1815. He died April 4, 1817. *Consult* Histoire Militaire de Masséna, E. Gachot 4 vols., 1901-13.

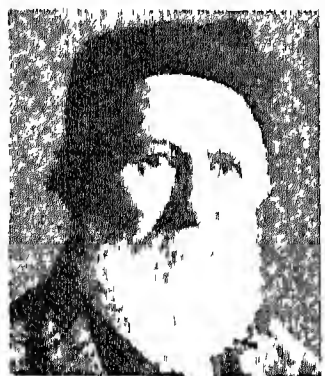
Massenet, JULES ÉMILE FRÉDÉRIC (1842-1912). French composer. Born May 12, 1842, he



J. E. F. Massenet,
French composer

studied at the Paris Conservatoire, where he had a distinguished career and became professor of composition, his talents winning for him also membership of the Academy and the Legion of Honour. His first opera was produced in 1867, and for the next forty years he turned out a succession of operas, oratorios, overtures, orchestral suites, etc. The most successful of his operas are *Le Cid*, *Manon*, *Thaïs*, and *Le Roi de Lahore*. He died Aug. 14, 1912.

Massey, GERALD (1828-1907). British poet and mystic. Born near Tring, Hertfordshire, May 28, 1828,



Gerald Massey,
British poet

the son of a bargee, he began work in a mill at the age of eight, and at 15 was working in London as an errand boy. Devoting his leisure to study, at 21 he was editing a Chartist journal, and fell under the influence of F. D. Maurice. Among his best efforts are *The Ballad of Babe Christabel*, *Sir Richard Grenville's Last Fight*, and *Ten Kings*. In the latter part of his life Massey's interest was chiefly absorbed by spiritualism and Egyptology; he wrote *Concerning Spiritualism*, 1871, and similar books, and lectured in America on mysticism. His *Ancient Egypt, The Light of the World*, 1907, is his most notable work as an

Egyptologist. He also published a fantastic interpretation of Shakespeare's sonnets, under the title *The Secret Drama of Shakespeare's Sonnets*, 1888. Died Oct. 29, 1907.

Massey, RAYMOND (b. 1896). Canadian-born U.S. actor and producer. Born at Toronto, Aug. 30,



Raymond Massey,
Canadian-born actor

1896, he was educated at the university there, and at Balliol College, Oxford. After serving in the First Great War, he made his début on the London stage at the Everyman Theatre, 1922, and later produced and acted in many well-known plays, e.g. *The White Château*, 1927; *The Man in Possession*, 1930; *The Rats of Norway*, 1933; *The Shining Hour*, 1934; *Idiot's Delight*, 1938. He made his first appearance on the New York stage in 1931, when he appeared as Hamlet, and his later Broadway successes included *Abe Lincoln in Illinois*, 1938; *Lovers and Friends*, 1943. He became a U.S. citizen in 1944.

Massey, VINCENT (b. 1887). Governor-general of Canada. Elder brother of Raymond Massey, he was born at Toronto, Feb. 20, 1887, and educated at St. Andrew's School, and the university there. After graduating at Balliol College, Oxford, he became lecturer in modern history at Toronto university (of which he later became governor and, in 1947, chancellor). After serving as president of the Massey-Harris co., 1921-25, he entered politics, and was minister without portfolio in the federal cabinet, 1925, attending the Imperial conference in London, 1926. Canadian minister to the U.S.A., 1926-30, high commissioner for Canada in Great Britain, 1935-46, in 1952 he succeeded Viscount Alexander of Tunis as gov.-gen. of Canada—the first Canadian to hold that position.

Massey, WILLIAM FERGUSON (1856-1925). New Zealand statesman. Born at Limavady, co. Derry, Ireland, March 26, 1856, and educated at Londonderry, he

went in 1870 to New Zealand, where he took up farming. He was elected to parliament in 1891, becoming chief opposition whip the following year, and leader of the opposition in 1903. In 1912 he became prime minister and minister of lands and labour. He was a member of the Imperial war cabinet, 1917-18, represented New Zealand at the peace conference in Paris, 1919, and attended the Imperial conference held in London, 1922. He died May 10, 1925.



W. F. Massey,
New Zealand statesman

Massicot. A form of the monoxide of lead (PbO). It occurs in nature as the mineral sometimes called lead ochre, which is brownish yellow in colour. It is now prepared by oxidising lead as the first stage in the production of red lead. The lead is melted in a reverberatory furnace, the temperature being kept above the melting point of lead and below that of the oxide which is continuously removed as it forms on the surface. So produced the massicot is a bright yellow pigment of coarse texture. If the temperature is allowed to rise above the melting point of the oxide the form known as litharge is produced. Massicot can also be produced by the careful oxidation of white lead. On further heating and oxidation the monoxide (litharge or massicot) is converted to red lead (Pb₃O₄). *See* Lead; Pigments.

Massillon, JEAN BAPTISTE (1663-1742). French prelate. Born at Hyères, June 24, 1663 the son of a notary, he became an Oratorian in 1681. He was bishop of Clermont from 1717 until his death, Sept. 18, 1742, when d'Alembert pronounced his eulogy in the French academy, to which he was elected in 1719. He was regarded as the greatest preacher of France, whose pulpit oratory was distinguished by its purity and elegance of style.

Unpopular at court, he pronounced the funeral oration over Louis XIV. and preached 10 Lenten



J. B. Massillon
French prelate

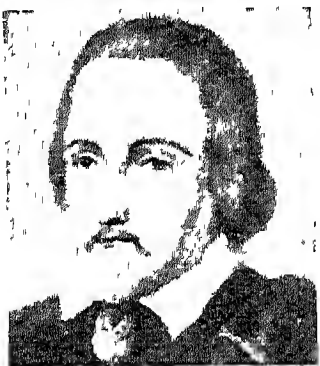
sermons (*Le Petit Carême*) before Louis XV in 1718, urging upon him the need of morality and just government. His one sermon before Louis XIV drew from the last named the famous epigram to the effect that while other preachers made him contented with them, Massillon made him discontented with himself.

Massine, LEONIDE (b. 1896). Russian dancer and choreographer. Born at Moscow. Aug. 9, 1896. he was educated at the imperial ballet school there, and succeeded Fokine and Nijinsky as leading male dancer and choreographer of the Diaghilev company. His finest part was generally considered to be the Miller in *The Three-Cornered Hat*. He introduced an angular and "earthy" element into the curves and elevation of classical ballet. In 1932 he joined the de Basil company, and his productions included *Jeux d'Enfants*, *Le Beau Danube*, *Union Pacific*, *Scuola di Ballo*, *Le Bal*, *Gaieté Parisienne*. He danced at the Metropolitan, New York, 1940-43, and reappeared at Covent Garden in 1947. One of the most famous dancers of his age, he also produced the dances for, and danced in, the films *Red Shoes*, 1948; *Tales of Hoffman*, 1951, and others.



Leonide Massine,
Russian dancer

Massinger, PHILIP (1583-1640). English dramatist. Born at Salisbury in Nov., 1583, and educated at St. Alban Hall, Oxford, he lived by his pen in London from 1606 till his death, March, 1640. He was buried in S. Saviour's, Southwark.



A voluminous writer, he is now known to have been part author of plays usually attributed to Beaumont and Fletcher. Fifteen of the plays which he wrote independently are extant. A master of plot and also of construction, his plays held the stage till the final quarter of the 19th century. Of his works, *The Bondman*, *The Maid of Honour*, *The Emperor of the East*, and *Believe As You List* (the last not printed till 1848) are still sometimes read. His masterpiece is *A New Way to Pay Old Debts*.

Massingham, HAROLD JOHN (1888-1952). British writer. Son of H. W. Massingham (*v.i.*), he was born March 25, 1888, and educated at Westminster and Queen's College, Oxford. A weekly contributor to *The Nation* and *Athenaeum*, 1916-24, and to *The Field* from 1938, he became noted for books on the English countryside, *e.g.* *In Praise of England*, 1924; *English Downland*, 1936; *Cotswold Country*, 1937; *A Countryman's Journal*, 1939; *Chiltern Country*, 1940; *The Wisdom of the Fields*, 1945; *Where Man Belongs*, 1946. He revered rustic crafts, Shakespeare, and naturalists, and hated new builders, whether in Henry VIII's days or his own. He died Aug. 22, 1952.

Massingham, HENRY WILLIAM (1860-1924). British journalist. Born at Old Catton, Norwich, and educated at Norwich grammar school, he entered journalism on the *Norfolk News*. In London he was successively editor of the *National Press Agency*, the *Star* (where he succeeded T. P. O'Connor), and the *Daily Chronicle*. Later he was for two years London editor of the *Manchester Guardian*, special parliamentary representative of the *Daily News* (1901-07) and then editor of the *Nation* until 1923. He died Aug. 27, 1924. A keen and incisive writer, of advanced radical views, he was also well-known for his wide acquaintance with French politics and literature.

Mass Number. Term used in physics. It is in the main used in connexion with atoms which exist in isotopic forms. Isotopic masses are essentially nuclear masses since practically the whole of the atomic mass is concentrated in the nucleus. From inspection of atomic weights and nuclear charges it appears that all nuclei except hydrogen must contain both protons and neutrons, the neutron being uncharged but possessing almost the same mass as the proton. If a proton be added to a given nucleus then the electric charge is thereby increased, producing a rise in atomic number and the creation of an atom in the next place in the periodic table. If a neutron is added to a nucleus the atomic number is unaffected, but an isotope is created since an increase of mass occurs.

Prout originally stated over 100 years ago that all the heavier atoms were built up of hydrogen, *i.e.* of protons and electrons; in the light of modern experience, however, his rule may be restated

as the whole-number rule: the masses of all atoms are nearly whole numbers with respect to 16 for the neutral oxygen atom. Hydrogen, however, does not fit into the scheme and actually Aston's more precise measurements made with the mass spectrograph (*q.v.*) showed slight deviations in nearly every case. The difficulty was surmounted by assuming that a part at least of the masses of the electron and proton were electromagnetic, so that the mass of a highly condensed structure was smaller than the sum of the component units, *i.e.* than of these if widely dispersed. Hence in the formation of a heavy nucleus energy must be released before a stable packing state is attained. The deviation of the mass of a nucleus from the whole number is termed the mass defect (δ). If N be the mass number of an isotope its mass in general will be $N - \delta$ and the ratio δ/N is a measure of the amount of packing of its constituent particles, *i.e.* of the stability of its nucleus.

Masson, ANTOINE (1636-1700). French engraver. Born at Louvry, near Orléans, he at first engraved ornaments on steel. Settling in Paris, he devoted himself to painting portraits, but became famous for his line engravings. In 1679 he was elected to the Academy in Paris, where he died, 1700.

Masson, DAVID (1822-1907). Scottish essayist and biographer. Born at Aberdeen, Dec. 2, 1822, and educated at Marischal College and Edinburgh university, he was professor of English literature, University College, London, 1852-65, and held the chair of rhetoric and English literature at Edinburgh university, 1865-95. He became editor of the privy council register of Scotland in 1878, and historiographer royal for Scotland in 1893. He died at Edinburgh, Oct. 6, 1907.



David Masson
Elliott & Fry

His numerous works include a monumental *Life of John Milton*, 6 vols., 1859-80; *British Novelists and Their Styles*, 1859; *Life of Drummond of Hawthornden*, 1873; *Life of De Quincey*, 1878; and *Edinburgh Sketches and Memories*, 1892. He was the first editor of *Macmillan's Magazine*, 1859-67, and a man of solid learning, keen intellect, and abounding energy.

Married in 1853 to Emily Rosaline Orme, he left three daughters and one son, Sir David Orme Masson (1858-1937), for 37 years professor of chemistry at Melbourne.

Masson, Frédéric (1847-1923). French historian. He was born at Asnières, and early devoted himself to a close study of Napoleon and his family. The result was a series of valuable volumes, which included *Napoléon et les Femmes*, 1893, Eng. trans. *Napoleon and the Fair Sex*, 1894; *Napoléon Inconnu*, 1895; *Joséphine, Impératrice et Reine*, 1898; *Napoléon et sa Famille*, 9 vols., 1897-1913; *Napoléon et son Fils*, 1904. He was elected a member of the Academy in 1903, and died Feb. 19, 1923.

Massorah. Rabbinical term for tradition. It has special reference to the text of the Hebrew Bible, and the efforts made to preserve it uncorrupted. Rules to this end were handed down orally from one generation to another, until the text was finally settled. There are two forms, the eastern and western, or Babylonian and Palestinian, which differ in vowels, accents, and system of punctuation. Those who have made the subject one of special study are called Massoretes. The standard Massorah text is that of Ginsburg. *See* Mishna; Talmud; *consult also* The Massorah ha-Massoreth of Elias Levita, 1867, 1880-1905; The Massorah Compiled from MSS., 4 vols., C. D. Ginsburg, 1906.

Mass Observation. British organization for sociological research. Founded in 1937 by Tom Harrisson and Charles Madge, it studies the habits, attitudes, and opinions of the British people, and disseminates the ascertained facts. It employs full-time field-workers assisted by a nation-wide panel of voluntary observers. Stressing the specialised questionnaire, it carries out surveys of public opinion on behalf of government departments, commercial organizations, religious and political groups, etc. Mass Observation reports published in book form include *Britain, 1939*; *War Begins at Home*, 1940; *Clothes Rationing*, 1941; *People in Production*, 1942; *Britain and Her Birth Rate*, 1945; *Peace and Public*, 1947; *Puzzled People*, 1947. The head office is at 7, Kensington Church Court, London, W.8.

Mass Production. Term implying the manufacture in bulk of any article. The principle is to split manufacture into a multitude of simple operations which can easily be taught to the workers. Each

worker has to carry out one comparatively simple operation, the article gradually being assembled or completed as it passes from one operative to another on a conveyor. Little is left to the initiative of the employee, and tools and machinery play an increasingly large part. The great disadvantage is the deadly monotony of work, though in well managed factories this may be mitigated by frequent changes of task.

The motor industry is usually given the credit of developing mass production beyond the experimental stage, and the Ford Company of America is regarded as having carried out the biggest development of the method under a single management and for a single purpose. Ford was able by mass production not only to pay his ordinary workers the highest wages, but also to sell his product at the lowest price and still make an enormous profit. By 1926 2,000,000 Ford cars a year were made and placed on the market. In Europe one who nearly approached the American ideal was Thomas Bata, shoe manufacturer, of Zlin, Czechoslovakia. Like Ford, he paid good wages; sold his shoes for the lowest price in the world; tried to limit his production to a small number of models; and introduced a profit-sharing scheme for his employees.

Mass production methods have been introduced into nearly every industry in which machinery can replace human labour, e.g. clothing, prefabricated houses, bicycles, wireless sets, and certain branches of food production. During the Second Great War the method was adopted in all highly industrialised countries for munitions, aircraft, and shipping. To overcome the serious shortage of shipping amongst the Allies, Henry J. Kaiser (*q.v.*) revolutionised shipbuilding by making sections of vessels in factories and assembling them at his shipyards. He next turned his attention to aircraft, and by 1944 one of his factories could turn out 150 fighters a month. *See* Bedaux, C. E.

Mass Spectrograph. Instrument used in physics. It was a development of the discovery of "positive rays" (originally termed "canal rays") by Goldstein in 1886. These rays consist of atoms or groups of atoms, which, by collision, have lost one or more electrons in the intense electric field between the electrodes of a low pressure discharge tube. They may be detected as an emerging

beam in the space behind the cathode if the latter is suitably perforated. J. J. Thomson made the first determination of the ratio of the charge E to the mass M of these positive particles by applying parallel electric and magnetic fields to the beam and observing the resultant deflections. Considerable attention has to be paid to the maintenance of a low gas pressure in the observation vessel. If x and y be the electrostatic and magnetic deflections respectively it follows that $y^2/x = kE/M$, in which k is a constant depending upon the values of the electric and magnetic fields.

By means of this positive-ray analysis Thomson showed that the gas neon consisted of two isotopes, which was later more accurately confirmed by Aston's apparatus which he called the mass spectrograph. This overcame the loss of intensity of the positive-ray beam, by bringing to the same focus all positive ions with the same E/M of any velocity.

With later instruments Aston obtained an accuracy of 1 in 10,000 and was able to show that most of the elements were complex, having in some cases as many as ten isotopes. He was also able to obtain fairly accurate measurements of the relative proportions of the various isotopes. These measurements are now usually made by a simpler type of instrument than that of Aston, e.g. the mass spectrometers of Dempster, Bainbridge, etc., which sort out all ions having a particular velocity, and pass them through a uniform magnetic field.

Massys, Quinten. A Flemish painter, otherwise known as Matsys and so described in this Encyclopedia.

Mast. In sailing vessels, the spar, set upright from the keel-plate, on which sail is set. Built-up masts comprise two or more sections, the upper of which may be lowered when reducing the amount of sail. From the deck upwards the sections are termed the lowermast, topmast, topgallant mast, and royal mast. Pole masts are usually constructed in a single piece. Metal masts, often used on racing yachts, are frequently hollow, internal bracing being provided to give the necessary strength. Where a ship has more than one mast a distinctive name is given to each, e.g. foremast, mainmast, and mizzen or mizzenmast. The word is also used for any more or less vertical pole or narrow built-up structure

for supporting, *e.g.* the antenna of a wireless telegraphy station, or the overhead trolley of an electrically propelled vehicle.

Mastaba (Arab. bench). Early form of Egyptian tomb, with a rectangular superstructure and sloping sides. Those of the first and second dynasty pharaohs at Sak-kara had elaborate panelled decoration in sun-dried brick; they were some 180 ft. long by 75 ft. wide and contained magazines crammed with furniture and supplies for the dead king, above the tomb-chamber in which he was buried. When in the IIIrd dynasty the kings of Egypt adopted the pyramid tomb, nobles of their court were buried in stone mastabas around them; at Gizeh they were arranged in regular streets. There was generally a "false door" (stela) on the river face for the use of the departed; a chamber of offerings, often sculptured; a secret niche (serdab) for the sculptured "double"; and an aperture through which it received the offerings and incense. The tomb-chamber was beneath.

Master (Lat. *magister*, master). Term for a man exercising control, authority, or headship, especially one empowered to direct or teach. The word has many applications. Formerly used in England as a title for the male head of a household, or for any man, it is now replaced in this sense by the modified form Mr., *pron.* mister. The eldest son of a Scottish viscount or baron is known as master, *e.g.* the master of Stair. In popular usage a boy may be addressed or written to as Master Harry Smith.

The British royal household has its master of the household, of the horse, of ceremonies, and of the king's musick. The master of the revels was originally supervisor of royal entertainments, and gradually developed into a stage censor. The heads of most colleges in Cambridge, and of some in Oxford, are called master. The chief official of a hunt is called the master. The incumbent of the Temple Church in London is called the Master of the Temple, a title originally borne by the grand master of the Knights Templars. In freemasonry a master mason is any mason who has passed the third degree, and is not to be confused with the master of a lodge.

The commander of a merchant ship is the master, originally master-mariner or sailing-master, by courtesy called captain. The term old masters is applied to

the great painters from the 13th to the 17th centuries approximately, and also to their works. Master is the title of a university degree in the faculty of arts, originally conferring a licence to teach in the university. In some British universities it is used for the degrees in science and surgery. (*See* Degree.) As a title of respect it is sometimes used by those in artistic professions in addressing an acknowledged superior (*cf.* Ital. *Maestro*).

MASTER AND SERVANT. This legal relation is created where one person hires the services of another, either generally or for a fixed period, in such a way that the servant is bound to obey all reasonable commands of the master; and, moreover, can be told not only what work to do, but how to do it. He is to be distinguished from a sub-contractor, who agrees to do certain work at a price, but does it, within limits, in his own way, and may himself hire servants to help him. He is also to be distinguished from an agent who acts for the principal within the limits of his authority, and for strictly defined purposes.

Such questions as wages and notice depend primarily on agreement. In the absence of any agreement a servant's engagement is for a year, and from year to year, but subject to being determined by notice which is fixed by general or local custom. As a rule, the more important the situation the longer is the notice required. By long custom a menial (*i.e.* an indoor) servant gives or takes a month's notice. In other cases, apart from special custom, it is for a jury to say what is a reasonable notice. Workmen, *i.e.* trade servants, are usually entitled to a week. A master or mistress is under no compulsion, as in Germany, to give a servant a character; but, if one is given, it must not be a false one, or the giver of it is guilty of a crime.

If a character is given to a prospective employer who applies for it, it is privileged, however derogatory to the servant, unless express malice can be proved. Misconduct, or disobedience to reasonable orders, or insubordination, are grounds for dismissal without notice. A hiring or contract of service for more than a year should be in writing, and signed.

Master. Title of various legal officials in England. The master of the faculties is superintendent of the court of faculties, a tribunal belonging to the archbishop, which

does not hear pleas but grants licences or dispensations, such as licence to marry, erects monuments in a churchyard, or removes bodies after burial. Masters in lunacy are officials appointed by the lord chancellor as guardian of lunatics to hold commissions of lunacy, superintend the management of the estates of lunatics, and generally to act as directed by the rules in lunacy, or by the judge in lunacy acting thereunder.

Masters of the supreme court are officials with duties partly judicial, partly administrative. Under the Judicature Act of 1879 they replaced, in the king's bench division, the earlier sixteen masters of the common law courts, the king's coroner and attorney, the master of the crown office, the two record and writ clerks, and the three associates. There are also masters in the chancery division, that title having been substituted in 1897 for the former title of chief clerk. The masters of the supreme court hear summonses in chambers, hold inquiries as to damages, tax costs, and generally do much work requiring experience, knowledge of law, and a judicial mind. In almost every case there is a right of appeal to the judge from a master's decision. Under the Coinage Act, 1870, the chancellor of the exchequer for the time being is *ex officio* master of the mint.

Master-at-Arms. In the Royal Navy, the head of the police aboard a warship.

Master Builder, THE. English title of *Bygmester Solnaes*, a play in three acts by Henrik Ibsen (*q.v.*). One of Ibsen's most powerful studies of contemporary social life and morality, it was produced in 1892. Trans. into Eng. by William Archer and Edmund Gosse, it was produced at the Trafalgar Square Theatre, London, Feb. 20, 1893, with Elizabeth Robins and Herbert Waring in the chief parts. It has often been revived, *e.g.* by Donald Wolfit at the Westminster Theatre, 1943.

Master Cutler. Dignitary of the city of Sheffield, England. Ranking next to the lord mayor as the most important civic figure, he presides over the ancient Cutlers' Company. The company exercises jurisdiction over the metal industries in the W. Riding of Yorkshire.

Master Gunner. Honorary rank borne by an officer of the Royal Artillery and awarded by the sovereign. *See* Gunner.

Master Humphrey's Clock. Title of a weekly magazine, in which Charles Dickens proposed to

publish short miscellaneous papers and occasional continued stories, introduced and connected by the machinery of a club, all material to be written by himself. The miscellany, started on April 4, 1840, ran until Nov. 27, 1841. The public was disappointed on discovering that the publication was not a continuous tale, though a fillip was given to the general scheme by the reappearance of Mr. Pickwick and the Wellers; but the numbers soon became only a vehicle for first the publication of *The Old Curiosity Shop*, then of *Barnaby Rudge*, the periodical ending with the completion of the latter story.

Master Mariners, HONOURABLE COMPANY OF. Company formed in 1926 to forward the interests of the British merchant navy service. Incorporated 1927, it received a grant of livery from the City of London in 1932. The former Admiralty sloop *Wellington* (*q.v.*), moored in the Thames, is the co.'s h.q. and livery hall.

Master of the Fleet. Officer in the Royal Navy. He is the navigation expert on an admiral's staff and his duty is to arrange the anchorages of the ships when the fleet goes into harbour, etc. Whenever a royal review is held, a master of the fleet is appointed.

Master of the Horse. Officer of the sovereign's household. In the British royal household he is the third great officer of the court, and is a peer and privy councillor. He has control of the equeries, pages, grooms, and all the stable servants, and supervises the royal stables, stud, and kennels. Actually the chief or crown equerry is responsible for the stables and the stud. The pages of honour of the master of the horse carry the sovereign's train on state occasions.

In ancient Rome the master of the horse was an extraordinary magistrate, properly commander of the cavalry, but appointed on the occasion of a dictatorship as lieutenant of the dictator.

Master of the Queen's (King's) Musick. The musician responsible for the English sovereign's band. The appointment is now honorary rather than executive. There are records of bands being maintained at court as long ago as the reign of Edward IV, who had 13 minstrels with "trompets, shalmes, and small pypes"; and in 1660 Charles II instituted the "four and twenty fiddlers" in imitation of Louis XIV. The band of Victoria was reconstituted by the prince consort as a modern or-

chestra, and gave state concerts; but in Edward VII's reign these were discontinued. In charge of the activities of these musicians was a master of the musick (*Fr. musique*, a band). Among those who have held the post are John Eccles, 1700-35; William Boyce, 1755-79; Sir Walter Parratt, 1893-1924; Sir Edward Elgar, 1924-34; Sir Walford Davies, 1934-41; Sir Arnold Bax, 1942-53; Sir Arthur Bliss, from 1953.

Master of the Rolls. Official of the English high court of justice. At first the chief clerk of the king's chancery, he obtained his present name, master or keeper of the rolls (*Lat. custos rotulorum*), before 1500, because he had charge of the rolls and records of the court, including the grants which had passed the great seal. Later he ceased to discharge this duty and became a judge of the court of chancery, acting as the vice-chancellor. He now presides over the court of appeal, and ranks after the lord chief justice. Before the Judicature Act of 1873, he was permitted to sit in the house of commons, the only judge enjoying that privilege. His salary is £6,000 a year, and he is usually made a peer. He has charge of the public records, this duty having been given back to him by an Act of 1838, and is chairman of the Historical Manuscripts Commission. Through the Law Society he controls the admission and conduct of solicitors. *See* Chancery.

Master Pilot. Rank in the Royal Air Force. Approved by the king in 1945, it is the senior rank for non-commissioned aircrew. The badge is the R.A.F. eagle in a laurel wreath surmounted by the royal coat-of-arms. It is worn on the lower part of the sleeve in the same position as a warrant officer's badge of rank. There are also master navigators, master signallers, master engineers, and master gunners in the R.A.F.

Masters. Term applied to unknown authors of pictures and engravings which have become famous. It is coupled with distinguishing allusions divided into two classes: (1) those distinguished by marks such as initials and dates, (2) those named from some salient characteristic of style or subject.

The most important Masters include: Master B. M., a pupil of Schongauer, who engraved *The Judgment of Solomon*, *S. John in Patmos*, etc. Master of the Playing Cards, c. 1446: he had great influence on engraving in the North, and examples of his work

are in Paris and Dresden. Master of 1446, a German engraver who engraved *The Passion*, *The Scourging of Christ*, 1446, the earliest engraving known. Master of 1423, a German who produced the earliest dated woodcut, *S. Christopher*, now belonging to Lord Spencer. Master E. S., 15th century, probably from Strasbourg; 323 of his plates are known, the chief of these, *The Madonna of Einsiedeln*, bearing his coat of arms and the date 1466. Master of the Amsterdam Cabinet, 15th cent., from Frankfort or Mainz; his 89 engravings are mostly at Amsterdam; he is also known as Master of the Medieval House Book. Master of the Life of Mary (or Life of the Virgin), 15th century, German, school of Cologne; he painted the Life of Mary, seven panels of which are in Munich, and the eighth, the Presentation in the Temple, in the National Gallery, London. Master of Werden, 15th century, German; four of his pictures, from the Abbey of Werden near Düsseldorf, are in the National Gallery, London. *See* Little Masters.

Masters, EDGAR LEE (1869-1950). U.S. poet. Born at Garnett, Kansas, Aug. 23, 1869, he was made nationally famous by his *Spoon River Anthology*, 1915, a hundred bitterly satirical poems describing, in contrast to their eulogistic epitaphs, the real characters of the dead in a typical American cemetery. He also wrote *Lives of Lincoln*, 1931, and *Mark Twain*, 1938. Died Mar. 5, 1950.

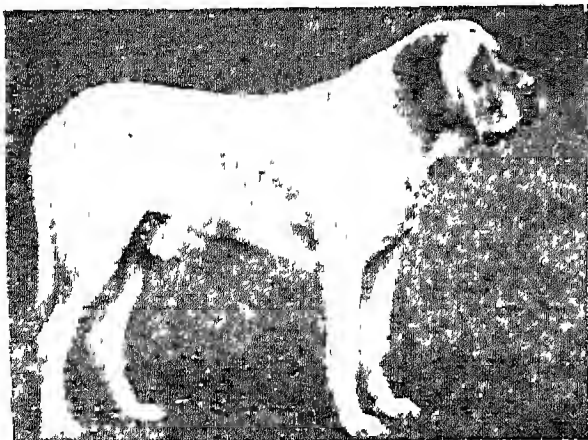
Masterton. Town of North Island, New Zealand. Situated 67 m. N.E. of Wellington by rly., it is the centre of one of the finest sheep-rearing areas in the world, and produces lamb and wool for the export market. Pop. (1951) 11,542.

Mastic. Variety of gum resin, used in the East as a chewing gum. The resin is a product of the mastic or lentisk tree, and is obtained by cutting the bark, the liquid oozing through and hardening in yellow masses or small drops. It is extensively used in the manufacture of varnishes for map-making, and in dentistry as a tooth-stopping. The lentisk plant is indigenous to the Mediterranean coast region, and various plants yielding a similar substance are found in S. Africa, India, and S. America.

Mastication. The crushing or chewing of food in the mouth. This is effected by the teeth, the action of the muscles of the tongue and cheeks being to press the particles of food again and again between the teeth until they are broken up.

Mastication is an important preliminary process in digestion.

Mastiff. Dog of extreme antiquity, possibly of eastern origin, which existed before the Christian era, and in earlier times was called



Mastiff. Champion specimen of the English breed

the ban-dog. Mastiffs were used for guarding but, from the savage laws enforced against them in Norman times, probably also for hunting, and later for bull and bear baiting. By 1945 very few mastiffs were left in England, and those few were too old for breeding. American dogs, descended from stock imported from England in the 19th century, were brought over to revive this fine breed, which was firmly re-established in England. The mastiff is large and massive, strong and of great nobility, courageous, and good-natured. The head is massive and square with a broad skull and short, blunt muzzle. The body is broad, deep, and long, the legs straight and strong, the neck arched. The coat is short and close, in colour apricot or silver, fawn or dark brindle. The muzzle, ears, and nose are black. Height, weight, and substance are important, but no figures are given in the official standard.

Mastitis. Medical term for inflammation of the breast. Septic material finds its way into the substance of the breast by the blood or the nipple. Treatment consists of giving penicillin or one of the broad-spectrum antibiotics to combat any pyogenic infection; if a local abscess forms it may have to be incised. Support with a bandage often gives relief.

Mastodon (Gr. *mastos*, breast; *odous*, tooth). Fossil elephant. The mastodon, so called from the conical tubercles or projections on its teeth, was of a more primitive type than the mammoth, and its remains are more widely scattered, fossil skeletons having been found in Egypt, Europe, N. America,

and Asia. It lived in the Miocene age and died out during the Pleistocene. The American mastodon resembled the modern Indian elephant both in size and in shape of tusks. From remains found in peat bogs it is known that the animal fed on the leaves and bark of conifers, and was covered with a thick, woolly, brown hair much like the mammoth.

Mastodonsaurus. Fossil amphibian labyrinthodont found in rocks of the Triassic period. It was the largest known labyrinthodont batrachian, having a skull four feet long and a body ten feet long. Its remains have been found in England, Württemberg, and India.

Mastoid. The bony mass felt immediately behind the ear is called the mastoid process. It contains cavities of which one communicates with the middle ear and is thus liable to share any infection of the middle ear. Formerly inflammation of the mastoid often required surgical treatment, but with the use of penicillin and the broad-spectrum antibiotics most cases now clear up without the need for surgical intervention.

Masulipatam. Port of India, in Andhra Union. The headquarters of Kistna dist., it is situated N. of the Kistna delta, at the end of a branch rly. from Bezwada. Its name means "fish-town." Printed cottons, canopies, prayer cloths, etc., are manufactured, but this industry, like that of carpet weaving, is decadent. It has a Sanskrit and two other colleges affiliated to Andhra University and Waltair. Pop. (1951) 77,953.

It was held by the rulers of Golconda in the 16th century. An English settlement was founded here in 1611, and after having been abandoned for a few years was re-established 1632. During 1686-90 it was held by the Dutch and in 1750 was given to the French by the nizam of Hyderabad. In 1758 Clive sent a force against it, and under Col. Forde it was taken in April. Its capture, a brilliant feat

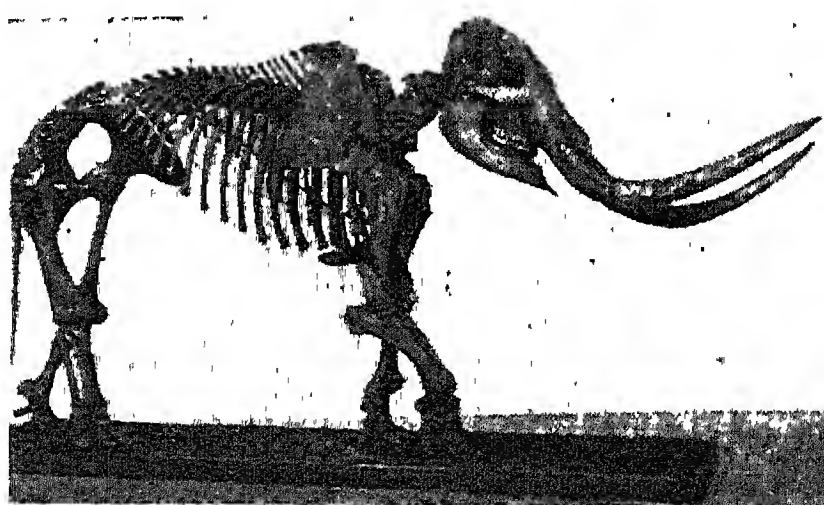
of arms, helped to extend the power of the East India co.

Masuria. Historic geographical name of an area of Poland; it is part of former East Prussia S. of a line running W. to E. just N. of Braunsberg (Pol. Braniewo) and Goldap (Goldapia). About 10,000 sq. m. in area, it had a pre-war pop. of c. 1½ millions, most of whom were expelled following the Russo-Polish treaty of Aug., 1945, settling the E. frontier of Poland. The Poles reconstituted it as the voivodship of Olsztyn, after its chief town, in 1952.

Masuria was originally the southern part of the former duchy of Prussia. Some wood, paper, glass, textile, and engineering industry existed in the towns; but much of its equipment was destroyed or dismantled during and immediately after the Second Great War. The country is rich in timber and contains several famous hunting preserves, of which the best known is probably the Rominten heath, favourite hunting ground of William II, and later of Goering.

In the 14th and 15th centuries Masuria merged with Poland and at the same time the Masurians started to settle in E. Prussia. In plebiscites held after the First Great War most of the people claimed German, not Polish, nationality. The Masurians have preserved numerous habits and traditions, and a wealth of popular songs and dances; their buildings, mainly of timber, have often characteristic gabled porches carried by pillars. Their religion, unlike that of other Polish tribes, is well-nigh exclusively Protestant. The Polish national dance Mazurka takes its name from the tribe. The name of Masuria is also connected with two battles of the First Great War: see Masurian Lakes. For the fighting here during the Second Great War, see Russo-German Campaigns.

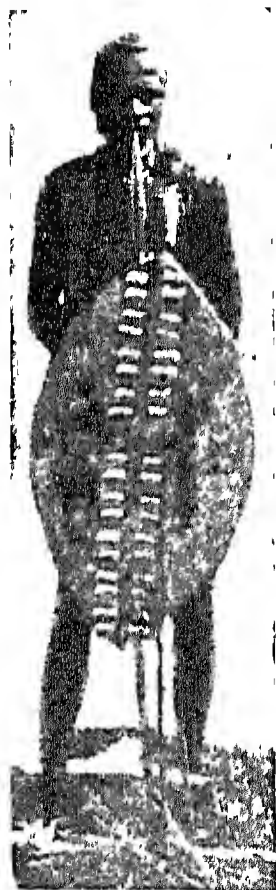
Masurian Lakes. Network of lakes, marshes, and water courses in Masuria. In the First Great War important fighting took place in this region between the Russian and German armies. Hindenburg gave the name "battle of the Masurian lakes" to the fighting of Sept. 5-15, 1914, which followed his victory at Tannenberg, when he attempted to crush the retreating Russian army. There was further heavy fighting in Feb., 1915, when Hindenburg concentrated 300,000 men against the Russian 10th army of 120,000. In the S. the Russians made a fighting retreat to the farther side of the Niemen, inflicting great losses on the



Mastodon. Skeleton of American mastodon found in northern Yukon
Natural History Museum, New York

German armies. To the north they were also driven from Tilsit and other towns, and one corps were forced to retreat by rly., leaving exposed the flank of the neighbouring corps, the 20th. The Germans made a heavy thrust and dispersed the 20th corps in confusion amid the forests and swamps. The latter, however, saved it from complete destruction and enabled a large number to escape to defensive lines between the Bobr and the Niemen. Here a counter-offensive had been prepared, and the Germans were slowly forced back until they reached positions only a few miles within the Russian frontier. Thus the German offensive was a failure; on the other hand, the Russians did not win back the line of the Masurian Lakes.

Matabele OR **AMANDEBELE**. Negro people of Bantu speech in S. Africa. In 1817 Umsiligazi, one of



Matabele warrior

Chaka's indunas, fled with a body of Abazanzi Zulus over the Drakensberg into the Transvaal, and dominated the Bechuana, until driven by the Boers across the Limpopo into Matabeleland in 1838. Under Umsiligazi's son Lobengula, who assumed sway in 1870, the confederation comprised the descendants of the original Abazanzi; the Abenbla derived from Bechuana war-captives; and the Maholi slaves, recruited from Mashona, Makalaka, and other unwarlike tribes. In battle the warriors used Chaka's short stabbing assagais, knobkerries, and oval shields, and raided Korana Hottentots and other aboriginal peoples. Their dialect is spoken in S. Rhodesia. They submitted to British rule in 1893 and 1896, becoming herdsmen and cultivators.

Matabeleland. District of S. Africa, now part of Rhodesia. It is named after the Matabele. It stretches from the Transvaal to Mashonaland, includes the watershed of the Zambesi and the Limpopo, is rich in minerals and fertile land. The chief towns are Bulawayo, Gwelo, and Selukwe.

Matabeleland was included in the grant made to the British S

Africa co. in 1889, this following a treaty between the tribal king, Lobengula, and Cecil Rhodes. The first settlements made by the new company were in Mashonaland, and against them the Matabele directed their raids, the successors of those against the Mashonas. In 1893 they were particularly active, and L. S. Jameson, with about 1,000 white men, marched to Bulawayo, Lobengula's capital. Twice the Matabele attacked in great force, only to be repulsed with heavy loss, while a third victory was won by a body of allies from Bechuanaland. Bulawayo was entered and Lobengula fled, and it was while pursuing him that Allan Wilson and his small force were killed, on the Shangani river. The Matabele were crushed, and their country became in reality part of the territory under the chartered company. Settlers entered the land and there was a spell of feverish activity in developing it.

In March, 1896, the Matabele rose in rebellion, seizing the opportunity offered by the Jameson Raid. They had legitimate grievances, but their savage methods of warfare were a danger to the white community. There was much fighting, but the struggle was ended after a meeting between Rhodes and the chiefs of the tribe in the Matoppo Hills in Sept. The country then settled down as an integral part of Rhodesia. See British S. Africa Co.; Rhodes, C. J.; Rhodesia; S. Africa. Consult The Downfall of Lobengula, W. A. Wills and L. T. Collingridge, 1894; The Matabele Campaign, R. S. S. Baden-Powell, 1897; Matabele Journals of Robert Moffat, ed. J. P. R. Wallis, 1945.

Matadi. River port of the Belgian Congo. Situated 70 m. above the mouth, it is the highest point to which ocean steamships can ascend the Congo. It is connected with Léopoldville by a rly. of 255 m., and forms the chief exporting and importing centre of the country. The rly. has been improved, and transport on the Congo and its tributaries has been much accelerated. Matadi is in the province of Léopoldville.

Matador (Sp., killer). Highest rank among professional bull-fighters. He is the man who has the task of actually killing the bull. See Bull-Fighting.

Matagalpa. Dept. and town of Central Nicaragua. Bounded S. by the river Matagalpa, the dept. is mostly mountainous and is intersected by the Rio Grande. Sugar,

coffee, and tobacco are cultivated. Matagalpa, the capital, stands in a high mountain valley. Population (estimated) 50,000.

Mata Hari (1876-1916). Dutch spy. Margaret Gertrud Zelle was born at Leenwarden, Aug. 7, 1876, and married a captain of the Dutch colonial forces named MacLeod, in 1895. She lived with him in Java until 1901, studied the ritualistic dances of the East, and on her return to Europe adopted the name Mata Hari (Eye of the Morning, Star of the Evening), cultivating a popular belief that she had been born in Java, was a half-caste, and had been a temple dancer. As a dancer at the Musée Guimet, Paris, in 1905, she was an immediate success, and went on to become a well-known courtesan. At the outbreak of the First Great War her influence over French and German military and diplomatic officials was supreme; she betrayed secrets to both sides until arrested by the French and executed as a spy, Oct. 15, 1916.

Matamoros. Town of Mexico in the state of Tamaulipas. It stands on the S. bank of the Rio Grande and opposite the town of Brownsville, Texas, U.S.A., being a customs port of entry to Mexico. It is 842 m. N. of Mexico City, the journey taking 33 hours by train. It is on the main inter-American highway. In the vicinity is an important cotton-growing region. Cattle, cotton, hides, and maize are also produced. Population (estimated) 18,000.

Matanzas. West-central prov. of Cuba. It borders the Strait of Florida and has an area of 3,253 sq. m. Hilly in the N., where the surface reaches 1,310 ft., it slopes to the S., where there are swamps. Sugar, bananas, etc., are produced. Area 3,256 sq. m.; pop. (1953) 395,798.



Matador in the costume of the bull-ring

Matanzas. City of Cuba. The capital of the prov. of Matanzas and the second seaport of the island, it lies at the head of Matanzas Bay, on the N. coast, 63 m. by rly. E. of Havana, to

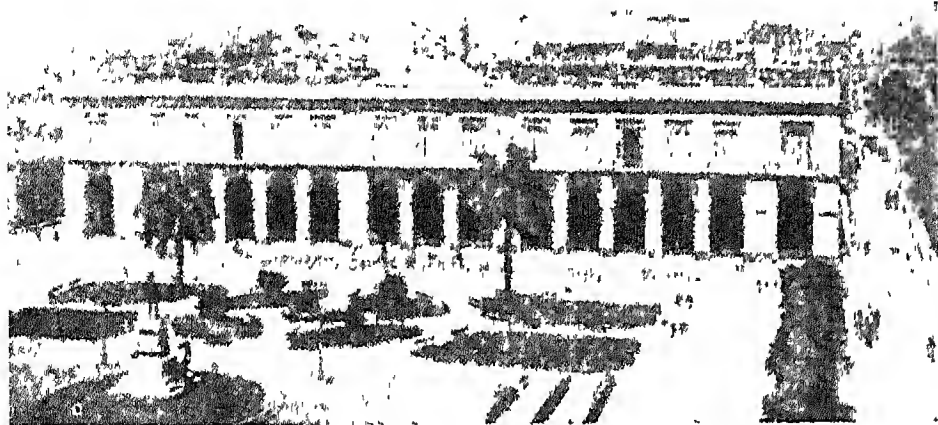
which it is also connected by the central highway. It has a well-sheltered but partly silted harbour and vessels lie in a roadstead and discharge by lighter. The town consists of three portions separated by the rivers San Juan and Yumuri, and among its larger buildings are the government building, theatre, casino, and lyceum. Matanzas has petroleum and sugar refineries, distilleries, rly. workshops, and manufactures of leather, boots and shoes, and cord, and its chief exports are sugar, rum, and molasses. The city was founded 1693. Pop. (1953) 82,618.

Matapan, BATTLE OF CAPE. Sea action of the Second Great War. The victory of Cape Matapan, March 28, 1941, so named from the point of land nearest to the scene of action, was the fruit of skilful cooperation between ships and aircraft of the Royal Navy. In 39 months of war the Italian fleet never showed any disposition to risk a battle, though in material strength it was at all times superior to the British Mediterranean fleet. To force it to fight was the constant endeavour of the British c.-in-c., Admiral Sir Andrew Cunningham; and at Matapan he did his utmost to bring about a general action.

At noon on March 27, 1941, three Italian cruisers and four destroyers were sighted by air reconnaissance almost midway between the toe of Italy and the Peloponnesus, steering in a S.E. direction. In the hope of intercepting this force, the Mediterranean fleet sailed from Alexandria at dusk the same day, when there was least chance of its movements being reported to the enemy. Four cruisers and four destroyers under the second-in-command, Vice-Admiral H. D. Pridham-Wippell, were ordered to rendezvous next morning south of Gavdhos, an islet lying to the southward of Crete.

The battle fleet, comprising the battleships Warspite (Cunningham's flagship), Barham (flagship of Rear-Admiral H. B. Rawlings), and Valiant, the aircraft carrier Formidable (flagship of Rear-Admiral D. W. Boyd), and eight destroyers, followed at the best speed of which the three battleships were capable.

One of the Formidable's aircraft sighted the Italian squadron soon after dawn on March 28, about 30 m. S. of Gavdhos, steering S.S.E. At 7.45 a.m. the Italians were in sight of Pridham-Wippell's ships. To draw the enemy towards the battle fleet, he turned to



Matanzas, Cuba. The Plaza, with harbour beyond

the S.E., and for over an hour they followed the bait thus held out to them, though they did not get within gun range. Just before 9 a.m. the enemy squadron reversed its course and was in turn pursued by the British. Apparently the Italians were also trying to set a trap, for just before 11 the big new battleship Vittorio Veneto appeared about 16 m. to the northward, and opened fire with her 15-in. guns on the British.

Almost at the same moment the Vittorio Veneto was sighted by Albacore torpedo aircraft from the Formidable, which had been ordered to attack the Italian cruisers. They turned on the new target, and inflicted a hit which reduced the Vittorio Veneto's speed by 50 p.c. and caused her to turn away to the westward.

As soon as the British cruisers had effected a junction with the battle fleet, at 12.30 p.m., a second air striking force flew off from the Formidable, and hit the Italian battleship with two more torpedoes. From this operation one of our aircraft was missing, the only loss suffered by the British fleet throughout the action. A second Italian force of five cruisers, which had been sighted in the meantime, showed no sign of wishing to come closer, but made off to the N.W. at 30 knots. Naval aircraft from Maleme, in Crete, carried out a third attack on the retreating Italian forces, and succeeded in torpedoing and disabling the 10,000-ton cruiser Pola. To her aid went three other cruisers and some destroyers, while the rest of the Italian ships promptly proceeded homeward.

At 10.25 p.m. these lagging cruisers were sighted by the Warspite. Searchlights were switched

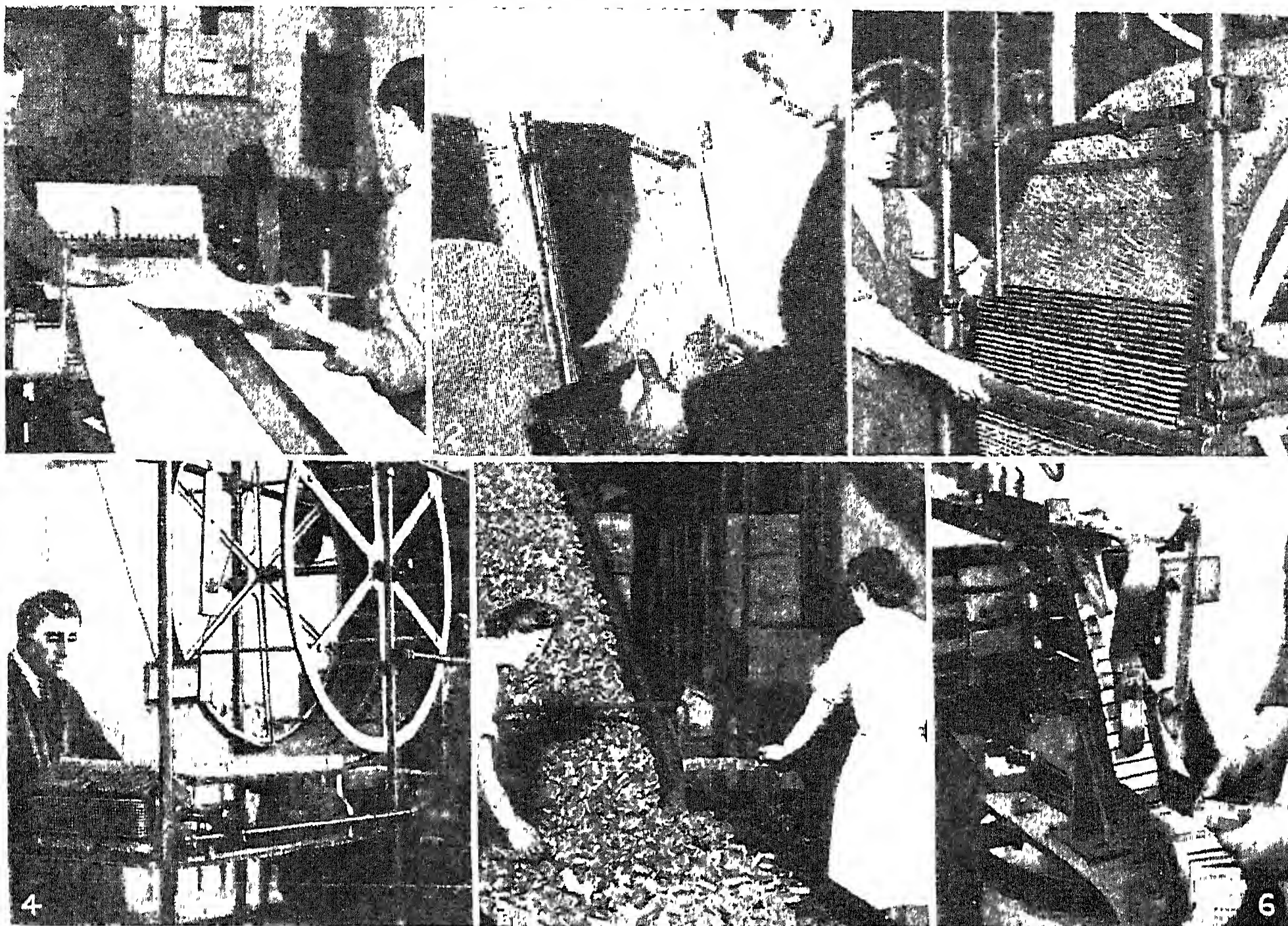
on by the attendant destroyers, and the Warspite and Valiant simultaneously opened fire on the Fiume, of 10,000 tons; she at once burst into flames. A second cruiser was set on fire by the Barham. All three battleships then concentrated their fire on a third ship. Enemy destroyers which fired torpedoes at the British battleships were also fired upon, and two were sunk. British destroyers completed the destruction of the three sister cruisers Fiume, Pola, and Zara, which offered little resistance. In the Pola discipline appeared to be non-existent. This night battle was the first occasion on which ship-borne radar was used in a major action. See Mediterranean Campaign.

Mataro. Seaport of Spain, 20 m. N.E. of Barcelona and in that province. It has manufactures of linen and cotton goods, soap, and chemicals, while wine is produced in the neighbourhood. Pop. (1950) 31,642.

Match (Fr. *mèche*, from late Lat. *myxa*, wick). Word commonly applied to a small piece of wood, waxed thread, or other material, tipped with a substance which can be ignited by friction and used to ignite other objects.

The first form of match consisted of splints tipped with potassium chlorate and sugar held together by gum. These were ignited by touching with concentrated sulphuric acid carried in a bottle. The lucifer match, invented in 1827, had a head of chlorate of potash and sulphuret of antimony, and was ignited by drawing the match head through a strip of glass-paper. That combination has been superseded by others, but all matches which can be struck on some rough surface have as their basic ingredients one substance rich in oxygen and another which easily combines with oxygen, the reaction between the two taking place with the evolution of heat on the application of friction. Potassium chlorate and phosphorus are two examples.

In the safety match, invented in the middle of the 19th century the phosphorus was separated from the composition on the match and transferred to the friction surface on the base. In many safety matches the head of the match is a mixture of potassium chlorate and antimony sulphide and the rubbing surface on the box contains red phosphorus. The use of yellow phosphorus for matches is now everywhere prohibited; but sesquisulphide of phosphorus, which



Match. Stages in manufacture. 1. Veneering from log of wood for match splints. 2. Charging magazine with splints which are put through a machine for coating heads with composition. 3. Revolving drum for drying matches after heads have been coated. 4. Another view of drying drum. 5. Matchbox-making machine. 6. Boxes of matches coming off the machine

lights readily with a moderate amount of friction, is used on match heads that strike anywhere.

Aspen and white pine are the chief woods used in match manufacture. The wood is cut into splints when green by special machinery, the usual method consisting in slicing off a veneer of match thickness, which is afterwards cut into bands or ribbons the length of the match. These ribbons are sliced in layers into match sticks. The dried sticks are fed into dipping frames which hold several thousand, and dipped in the composition. Round matches are cut by a machine with circular hollow cutters. Many matchmaking machines will cut nearly a million matches an hour. To lessen the risk of fire from burnt matches, the sticks are dipped in a fireproofing salt, which prevents smouldering.

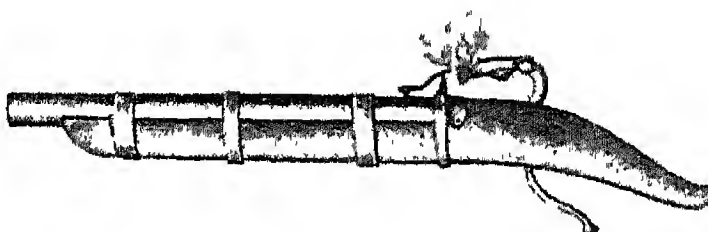
Book matches, a 20th century innovation, are prepared by inserting the cardboard, already cut to shape, in a frame, and dipping it first in paraffin wax, and then in a safety match composition. When the dipped cardboard is dry enough, it is stitched into a cardboard cover on which the friction surface has been mounted.

The matchmaking industry is controlled by special laws in most countries, aiming at the abolition of the use of white phosphorus, e.g. the White Matches Prohibition Act, 1908, in Great Britain.

Match Duty. Tax on the consumption of matches. In the United Kingdom customs and excise duties were imposed on matches by the Finance Act of 1916 at the rate of 5s. or 3s. 4d. per 10,000 matches, the former being when they were 80 or less in a box, and the latter when that number was exceeded. In addition, match manufacturers pay £1 a year for a licence. A previous attempt to introduce a tax of this kind had been made in the budget proposals for 1871-72. Robert Lowe, afterwards Lord Sherbrooke, introduced it with the jesting motto, *Ex luce lucellum* from light a little gain. The match manufacturers of London organ-

ized a procession of workers, chiefly women, to Westminster by way of protest, which caused the withdrawal of the proposed tax. In the U.S.A. the use of white phosphorus was checked by a heavy tax on matches made thereof. In France the making of matches is a state monopoly.

Matchlock. Hand gun in which the charge is fired by the application of a smouldering match to the touch-hole by a mechanical device actuated by moving a lever. The first hand guns, which came into use early in the 15th century, like the larger weapons, consisted of a simple iron or brass tube with a touch-hole on the top, the charge being fired by the application of a piece of smouldering, loose-spun cotton, or hemp cord, which had been soaked in a strong solution of saltpetre, and was called the match. Later, the touch-hole was moved to the side of the barrel and a flash-pan provided, the latter occasionally being fitted with a pivoted cover. To speed up firing, in some of the later weapons a roll of burning slow match was carried on the barrel, at



Matchlock. Early 16th century type. A piece of smouldering match was carried on the barrel to ignite the match on the serpentine (or curved lever) when a shot was about to be fired

which the yarn in the serpentine could be ignited just before it was desired to fire a shot. The matchlock was invented about 1460. In its earliest form it consisted of a serpentine (a curved lever) pivoted in a hole in the stock, which carried the burning match, and so balanced that the match was held away from the touch-hole until the end of the lever under the stock was pressed, when the glowing match was pushed into the flashpan and the charge fired. Matchlocks are still used by various tribes in Asia and in N. Africa. See Flintlock; Gun; Musket.

Mate. Literally a companion or equal. The word is sometimes used for a husband or wife. It is also used colloquially by workmen for those who work with them.

In the British navy, the rank of mate was held until 1861 by officers immediately junior to lieutenants, but in that year the rank of sub-lieutenant was substituted for it. In 1913 the title was again revived. With the double object of meeting the shortage in junior officers and of encouraging merit among the younger warrant officers and the petty officers and men of the fleet, the Admiralty directed that a number—originally fixed at 100—of the best of these should be selected for appointment as mates (ranking with sub-lieutenants), who would be advanced to the rank of lieutenant after two years or longer, according to their abilities. The rank was abolished in 1922. In the merchant service a mate is relatively a much more important officer, the first mate, or first officer, of a ship, ranking next after the captain.

Maté OR PARAGUAY TEA. Dried and powdered leaves of *Ilex paraguayensis*, infused and sweetened with sugar. It is sucked up through a special tube which strains off the leaf particles, is aromatic and somewhat bitter, and has refreshing and restorative effects. Large quantities are consumed in Argentina and Brazil. *I. paraguayensis* is a tree allied to the holly *Ilex aquifolium*.

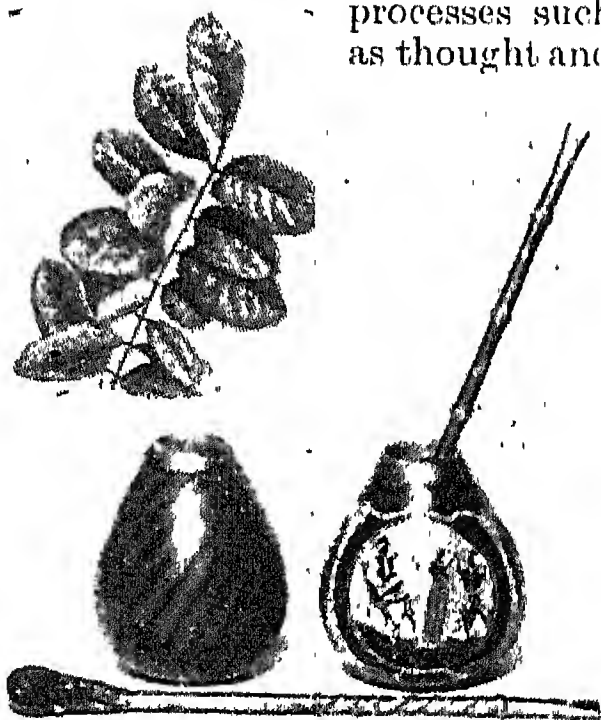
Mateotti, GIACOMO (1885-1924). Italian politician. Leader of the Socialist Unitario party in the parliament which assembled in 1924, he made a speech in the chamber charging the fascist party with terrorism and trickery in the conduct of the elections. Shortly afterwards, on June 10, he was abducted, many believed at the instigation of Mussolini, and his body, stabbed to death, was found three days later buried in a lonely

spot 12 m. from Rome. Fascist leaders were accused of complicity, and four of them—Marinelli, administrative secretary of the party; Filipelli, editor of the *Corriere Italiano*; Rossi, head of the official press bureau; and Naldi, editor of the *Nuovo Paese*—were arrested, together with others accused of the actual murder. Tried at Chieti, some of the accused were found guilty of unpremeditated accidental homicide, and sentenced to short terms of imprisonment; their associates were released. The horror caused by this political assassination threatened for a time to cause the overthrow of the fascist govt.

After the fall of the fascist regime the accused men, only four of whom were in court, the others being tried in their absence, were brought to trial a second time; and in April, 1947, Dumini Poveromo, and the absent Viola were sentenced to 30 years' imprisonment. Rossi and Giunta, with others who were absent, were acquitted.

Matera. City of Italy, capital of Matera prov. It is 42 m. E. of Potenza, and contains the cathedral of the archbishopric of Acerenza and Matera. At Monte Scaglioso, near by, are stone quarries and troglodyte caverns, still inhabited, and caves with 13th-century wall paintings. Pop. (1951) 30,339.

Materialism. Theory that regards matter as the prime cause of everything, even of mental processes such as thought and



Mate. Gourds, for holding the liquid tea, and bombillas through which it is sipped. Top, left, the leaves of the plant

consciousness. Materialism differs from hylozoism (*q.v.*), which is essentially a kind of pantheism not incompatible with religion, in that it leads, if carried to its logical extreme, to atheism and the most selfish form of eudaemonism.

According to the materialists all knowledge has its origin in sensation, merely consisting of transformed sensations; intellectual life is nothing but the result of mechanical combinations and interactions of matter. The soul itself is only a phenomenon of the brain; when the latter perishes, the soul perishes with it. Everything in the world takes place according to certain fixed, unalterable laws. There is no room for a God as Creator, or as a supernatural being capable of arresting or altering the course of nature. On the other hand, it should be remembered that we do not really know matter as it is, but only as it appears to us in the form of external phenomena; again, materialism is not capable of explaining the origin of mental processes from matter, since the combination and interaction of material elements can produce only material, not spiritual, results. See Free-thought; Theism.

Materia Medica. British medical publication. Produced by the British Medical Association, it first appeared in 1852 and deals with that branch of medical science which treats of drugs, their properties, doses, and uses, and their action on the body.

Maternity Benefit. Name given in Great Britain to money payable by the state to the wife of an insured man, or to an insured woman, on the birth of a child. Such benefit is a usual feature of state insurance systems.

In Great Britain a maternity benefit of 30s. was introduced under the National Insurance Act of 1911 and was raised to £2 in 1926; if a man and his wife were both insured, double benefit was payable. Under the National Insurance Act, 1946, benefit from July 1, 1948, was raised to a maternity grant of £4 on the birth of a child, with in addition 36s. a week for 13 weeks to a mother gainfully occupied, provided she gave up work for that period, attendant's allowance of £1 a week for 4 weeks being granted to a mother not qualified for full benefits. Rates of payment were revised from time to time.

Mathematics (Gr. *mathēma*, learning). The science of number and space and of all their relations. Some writers distinguish between mathematics, the methods used to discover certain truths, and Mathematics, the truths or relations discovered.

Mathematics is a unity, but for convenience in presentation it is usually subdivided into pure

mathematics and applied mathematics. The former may be divided into arithmetic, algebra, geometry, trigonometry, calculus, etc.; or it may be divided into geometry, the study of space and of spatial relations, and analysis, which includes arithmetic and algebra and deals with numbers, the relations between numbers, and the operations performed. In practice, however, the distinction between geometry and analysis is not clear-cut. Applied mathematics comprises the methods adopted to solve problems of mechanics (statics and dynamics) and other aspects of natural science and, more recently, problems of social science and technology.

The range of applied mathematics is as extensive as science itself, for research into, say, the relative value of artificial fertilisers no less than research into the structure of the atom uses mathematical techniques.

An Ancient Science

Mathematics, like most other sciences, has developed through the operation of two causes, human wonder and curiosity and human need, the desire to find out and the desire to learn how to do something. The earliest known civilizations had some method of counting and of recording possessions. Geometry (literally, measurement of the land) seems to have begun through the need of the Egyptians to restore the boundaries of land after the Nile inundations, and in the need of accurate measurement of size and direction in the building and orientation of the pyramids. The ancient Greeks, although freely using the knowledge gained from the Egyptians, developed geometry principally as an intellectual exercise. It speaks much for their work that parts of the elements of Euclid (330–275 B.C.) remained the English schoolboy's usual introduction to geometry until the 20th century. Pythagoras (c.550–500), Eudoxus (408–355), Euclid, and Apollonius (260–200) contributed to the foundation of mathematics. Archimedes (287–212) has been ranked with Newton and Gauss for his mathematical discoveries.

The Greeks, however, lacked the advantage of the greatest mathematical invention, the use of the zero and decimal notation. This seems to be of Hindu or Arabic origin, as are the beginnings of algebra, introduced into Italy in the 13th century.

Descartes (1596–1650) considerably improved its notation and methods; but he is principally remembered as the great originator of analytical or co-ordinate geometry, which applied algebraic methods to geometrical problems, and revolutionised mathematical conceptions and processes. A century later, Isaac Newton and Leibniz shared the honour of introducing the calculus, a tool of immense power, particularly in the application of mathematics to the problems of natural science, an activity in which Newton himself excelled.

The rich territory thus opened up through analytical geometry and the calculus has since yielded an abundant harvest through the discoveries of Gauss, Lagrange, Laplace, Poncelet, Hamilton, Abel, Weierstrass, Riemann, Cantor, Einstein, and many other giants, so that mathematics has not only revealed characteristics of the universe that would otherwise have remained hidden, but has provided investigators in every field with precision instruments far beyond the wildest dreams of the great Galileo.

It is no longer possible for any individual to see the limits either of mathematics or of mathematical methods. But it is not difficult even for the mediocre mathematician to agree with Bertrand Russell, "Mathematics, rightly viewed, possesses not only truth but supreme beauty . . . capable of a stern perfection such as only the greatest art can show." See Archimedes; Gauss; Newton, etc.; Algebra; Arithmetic; Calculus; Trigonometry, etc.; consult also Introduction to Mathematics, A. N. Whitehead, 1911; Short Account of the History of Mathematics, W. W. R. Ball, 5th ed., 1912; Mathematics for the Million, L. Hogben, 1937.

H. Watson

Mather, Cotton (1663–1728). American Colonial divine. One of a famous Puritan family, and grandson on his mother's side of John Cotton (1585–1652), he was born at Boston, Mass., Feb. 12, 1663. At Harvard he took his B.A. degree at 15, and becoming with his father, Increase Mather, co-pastor of the North Church in 1684, remained associated with it until his death. A notable linguist, he published some 400 works, notably *Magnalia Christi*, or Ecclesiastical History of New England, 7 vols., 1702, new ed., 2 vols., 1853; and left voluminous MSS., including a treatise

on medicine and a Scripture commentary in 6 vols.

Eminent as preacher, pastor, and philanthropist, a genius of curiously complex character, partly saint and partly fanatic—he inaugurated trials for witchcraft—he was thrice married, the third time unhappily, and, suffering through the dissolute character of his son Increase, met death, Feb. 13, 1728, with the words, My last enemy is come; I would say, my best friend. Consult Lives, B. Wendell, 1891; A. B. Marvin, 1892.

Mather, Increase (1639–1723). American Colonial divine. Born at Dorchester, Mass., June 21, 1639, he was the youngest son of Richard Mather (1596–1669), who, suspended for nonconformity, left Lancashire in 1635. Educated at Harvard and Trinity College, Dublin, Increase became a preacher in Devon and Guernsey, but refusing to conform at the Restoration, went to Boston, where he was ordained pastor of the North Church, June 6, 1664. He retained this office until his death, Aug. 23, 1723, and was also president of Harvard, 1685–1701. In 1662 he married Maria, daughter of John Cotton, by whom he had three sons and seven daughters. Noted for his love of learning and Puritan zeal, he secured an enlarged charter for Massachusetts from William III.

Mathew, Theobald (1790–1856). Irish temperance advocate. Born at Thomastown, near Cashel,



Theobald Mathew,
Irish temperance
advocate

Oct. 10, 1790, he studied at Maynooth, entered the order of S. Francis, was ordained in 1814, and given charge of a little chapel in a poor part of Cork. He laboured to secure education for the poverty-stricken people, and then in 1838 began to exercise his remarkable magnetic influence in the cause of total abstinence. At one time his followers are said to have numbered nearly half the adult population of Ireland, and his activities were reflected in a fall of 40 p.c. in the revenue from Irish spirits and in a great decrease in crime. Father Mathew visited London in 1843 and America in 1849, drawing crowds of converts to total abstinence. He died at Queenstown (Cobh), Dec. 8, 1856. There is a memoir by J. F. Maguire, 1863.

Mathews, CHARLES (1776-1835). British comedian. Born in London, June 28, 1776, the son of



Charles Mathews,
British comedian

a bookseller, he was educated at Merchant Taylors', and was engaged by the Theatre Royal, Dublin, in 1794, coming to London in 1803. Among the parts he played was that of Sir Fretful Plagiary in *The Critic*, a performance which Leigh Hunt regarded as perfect. Mathews's greatest success, however, was in the rôle of entertainer, in which capacity he became immensely popular on both sides of the Atlantic. He died at Plymouth, June 28, 1835.

Mathews, SIR CHARLES (1850-1920). British lawyer. Born in New York, Oct. 16, 1850, he was educated at Eton. He was called to the bar at the Middle Temple, 1872, and rapidly built up a large practice in criminal cases. Eloquence and power of cross-examination in many famous cases, including the Penge mystery, the trial of Lamson for murder, and the Mignonette case, brought him into prominence. In 1885 he was made a revising barrister, and in 1888 senior counsel to the treasury at the Old Bailey, in which capacity he took part in nearly all the celebrated criminal trials for some years. In 1907 he was knighted, in 1917 made a baronet. He was director of public prosecutions from 1908 until his death, June 6, 1920.



Sir C. Mathews,
British lawyer
Russell

Mathura. See *Muttra*.

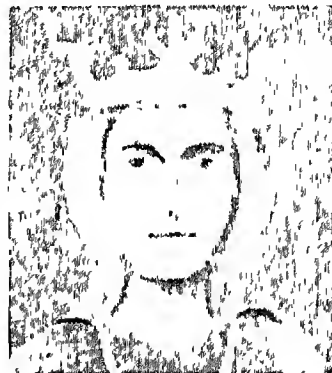
Matico. Dried leaves of a species of pepper, *Piper angustifolium*, belonging to the family Piperaceae. Native to Brazil and Bolivia, it is used in medicine as a styptic. An infusion or tincture forms an agreeable tonic and stimulant, its astringent properties being especially useful in catarrh of the bladder in aged patients.

Matilda (d. 1083). Queen of William the Conqueror. A daughter of Baldwin, count of Flanders, and a descendant of Alfred the Great, she married the duke of Normandy in 1053. Pope Leo IX had previously forbidden the marriage on the ground that the parties

were related, but the exact relationship, if any, has never been decided, and many stories, mostly fictitious, have been told about the supposed impediment. Pope Nicolas II finally granted a dispensation in 1059. Matilda ruled Normandy during her husband's absence in England, and was crowned queen of England at Westminster in 1068. She spent much time in Normandy, where she died Nov. 3, 1083, and she was buried in the church she built at Caen.

Matilda OR **MAUD** (1102-67). Queen of England and empress. Daughter of Henry I of England, she married the emperor Henry V (*q.v.*) in 1114. On the death of her husband in 1125 she returned to England and, being the only surviving child of Henry, was proclaimed heiress to the throne. In 1129 she married Geoffrey of Anjou, a step which created discontent amongst the nobles, so that, upon her father's death in 1135, Stephen was able to seize the crown without opposition. Matilda, who had been with her husband in France, landed in England in 1139, and, assisted by Robert, earl of Gloucester, defeated Stephen at Lincoln, 1141, and was crowned in London. The country was, however, in a state of civil war, and finding it impossible to make her claim effective Matilda returned to Normandy, leaving her son, afterwards King Henry II, to establish his claim to the crown. She died Sept. 10, 1167. See *Stephen*.

Matilda (1046-1115). Italian countess, known as the Great Countess. Daughter of Boniface II, count of Tuscany, she married in 1070 Godfrey V, duke of Lorraine, who died in 1076. On his demise Matilda joined the papal party against the emperors, and in 1077 Henry IV of Germany tendered his submission to Gregory VII at her castle of Canossa. She steadily supported the pope, and fought unaided against the emperor. In 1089 she married Welf, duke of Bavaria, at the time only 18 years of age, but this marriage was dissolved in 1095, and on her death, July 24, 1115, the whole of her vast estates, including Tuscany, Modena, Reggio, Brescia, Mantua, and Ferrara, were claimed by the Holy See in virtue of a grant made



Matilda,
Queen of England

by Matilda in 1077 and renewed in 1102. See *Gregory VII*.

Matilda Tank. An armoured vehicle used in the Second Great War by the British army. Popularly known in the army as the Waltzing Matilda, it went into service early in 1912, and was used with infantry for attacks on prepared positions. The vehicle weighed 28 tons and had a maximum speed of 16 m.p.h. It was armed with one 2-pr. and one Besa gun mounted in a turret.

Matin, Le (Fr. the morning). French daily newspaper. Founded in 1881 by an American, A. C. Edwards, from 1900 it was owned by the French financier Bunlau-Varilla. Bourgeois and nationalist in tone, it had a circulation up to 2 millions, a large network of correspondents abroad, and considerable influence. It was abolished by the Nazis in 1940, but revived under new editorial and business management after the liberation of France.

Matins OR **MATTINS** (Lat. *matutinus*, belonging to the morning). Ancient name for early morning prayers. In the English Prayer Book of 1549 the service of morning prayer was called matins; the words morning prayer were substituted in 1552, but the old word is retained in the tables of proper lessons and proper psalms. The existing service is formed from the ancient services for matins, lauds, and prime. The hour of matins has varied. Early custom favoured a time before daybreak; later, 6 or 7 a.m. was usual; and in 1714 the service was first held on Sundays in London at 11 a.m. See *Canonical Hours*.

Matisse, HENRI (1869-1954). French painter. A native of Le Cateau, Dec. 31, 1869, he went to Paris in 1892 to complete his training as a barrister, but, abandoning the law, studied at the Beaux-Arts under Moreau. After experimenting with impressionism, he became a leading member of the revolutionary Fauves, declaring that he aimed at the utmost simplification. Primarily that of a designer and decorator, his style was characterised by large, flat areas of pure colour, and his abstractions, with distortion of the person in the manner of El Greco, represent the height of his intellectual conception of form. By painting what his eye immediately saw, Matisse achieved an integral vision that had a profound effect upon contemporary artists, notably Derain (*q.v.*). Influenced by negro art, he painted portraits, land-



Matisse. A still-life painting by Henri Matisse; it was exhibited at the Paris Salon in 1944

Photo, Marc Vaur

scapes, still life, and interiors. A brilliant lithographer, he illustrated Mallarmé's *Poésies*. He is represented in the leading European and American galleries; *Odalisque* and *Le Buffet*, are in the Luxembourg, Paris. Matisse died at his home at Nice, Nov. 3, 1954. Consult A Study, R. Fry, 1930.

Matlock. Name of several adjacent places in Derbyshire, England, comprising an urban district. Matlock is a market town and parish, standing on the Derwent. It is 17 m. N. of Derby, on the A6 road, and has a rly. station. Its chief industries are making and bleaching cotton, flour and colour mills, and quarrying limestone. Market days, Tues. and Fri.

Matlock Bath, a mile S., has thermal springs first used in 1698 for gout, etc., and hydropathy was long practised there.

The Matlocks are famed for their beautiful surroundings, which include High Tor and other rocks along the Derwent, and stalactite caverns visited by thousands every year. Pop. (1951) 17,770.

Matoppo Hills. Range of hills in S. Rhodesia about 18 m. S.E. of Bulawayo. The district is about 100 m. long, its greatest breadth being 25

m., and covers an area of 1,040 sq. m. It is a wild region, in parts almost inaccessible, but crossed by fertile valleys. The grave of Cecil Rhodes is situated on The World's View, in a national park which contains a small preserve for African game and the Matoppo Dam built to irrigate the surrounding country. The cemetery was consecrated by Rhodes to those who deserved well of their country, and contains the remains of Major Allan Wilson and Sir Starr Jameson.

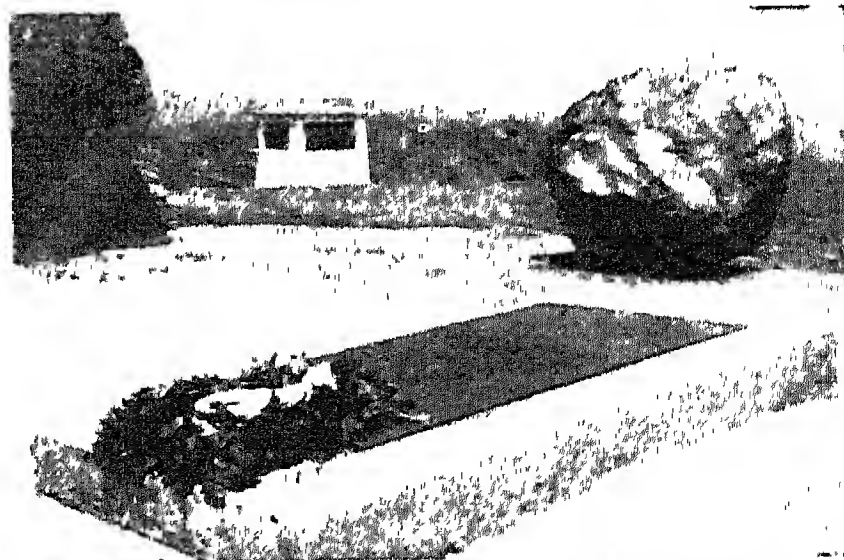
The hills proved impregnable when held by the Matabele during the rebellion of 1896-97.

Matriarchy (Lat. *mater*, mother; Gr. *archē*, rule). Form of social organization under which personal rights, duties, and restrictions are determined from the maternal side. Social anthropologists tend to prefer the alternative term "mother-right." It is threefold in form—matrilineal, in which descent and inheritance are reckoned along the mother's line; matri-local, in which the wife

resides with her own people, the husband being an occasional or permanent guest; and matri-potestal, in which child control and choice of mate rest with the mother and her people, often with

her brother as head of the family. In aboriginal America mother-right in its three-fold form is present among the Seri and the Pueblo Indians at opposite ends of primitive culture. The theory of a primeval promiscuity which passed into matriarchy, and this into patriarchy, lacks support. See Family.

Matriculation (Lat. *matricula*, public register). Process of admittance to the membership of a university or college. In any university admittance is conditional on evidence that the student has attained prescribed standards in a number of specified subjects, either in the examination for the general certificate of education, conducted at his school, or at an examination conducted by the university. The subjects demanded comprise English and four or five other subjects, including a foreign language, and mathematics or an approved science, and at Oxford and Cambridge Latin or Greek. Until 1951 the London matriculation examination was taken by hundreds of students merely as a certification of



Matoppo Hills, Matabeleland. Grave of Cecil Rhodes; in the background is the memorial to the British who fell fighting against the Matabele, Dec. 4, 1893

general education. The matriculation examination at Oxford is called Responsions; at Cambridge the Previous examination or "little-go." See University.

Matrimonial Causes Acts. Acts of parliament regulating proceedings between husband and wife relating to their marriage. That of 1857 removed matrimonial causes from the jurisdiction of the ecclesiastical courts and set up a new court for divorce and matrimonial causes. For the first time it gave a court power to grant divorce, which formerly was possible only by Act of parliament. After further changes had been made in the law of divorce, the Matrimonial Causes Act of 1937 widely extended the ground for divorce and nullity. An Act of 1950 consolidated divorce law.



Matlock, Derbyshire. Matlock Bath, in the wooded dale watered by the river Derwent

Matrix (Lat., womb). Word used in several senses. (1) The material of a mould in which an object is shaped or formed. (2) In geology, the material in which a different substance, *e.g.* a fossil or diamond, is embedded. (3) In concrete, the hydraulic lime or cement, combined with water, which binds the sand, stone, etc., with which it is mixed, and which is termed the aggregate. (4) In typefounding, a metal mould for casting type. (5) In electrotyping and stereotyping, a flong or mould, usually of papier-mâché, which contains the impression of a page of type, and from which plates are cast for printing. (6) In a linotype machine, a brass plate with an intaglio of the letter it is to produce in relief. (7) In metallography, the ground mass or last-freezing constituent in which other constituents appear embedded. (8) In powder metallurgy, that metallic constituent of a powder mixture which has the lower melting point and melts during sintering. See *Electrotyping*; *Linotype*; *Printing*.

Matron (Lat. *matrona*, married woman). Term of Roman origin, used at first for a married woman of unblemished character. This idea has persisted, but the word now refers chiefly to a mature woman, not necessarily married, who is the head of a hospital or orphanage, and to one who has charge of the domestic arrangements of a school or college. There is a matron-in-chief directing Queen Alexandra's Imperial Military Nursing Service, who is attached to the department of the adjutant-general at the War office. Queen Alexandra's Royal Navy Nursing Service is controlled by a matron-in-chief at the Admiralty. A jury of "matrons or other discreet women" was formerly empanelled if a woman found guilty of a capital offence pleaded she was pregnant and asked for execution to be postponed on that account. These juries were abolished in 1931, and the

pregnancy of a woman in such circumstances is now decided by the jury which tried her. If found pregnant, she cannot be sentenced to death.

Matronalia. In ancient Rome, festival celebrated by married women in honour of Juno on March 1. Crowned with flowers, they went in procession to the temple of Juno Lucina on the Esquiline, and offered up prayers for the happiness of married life.

Matsoth OR **Mazzot** (Heb., sing. *mazza*). Jewish unleavened bread. This word is derived from *matsels* or *matsah*, pressed, because the bread is as though pressed together; or from an Arabic word meaning pure and sincere, implying that the bread is made from pure flour and water with no admixture. Eaten at the Feast of the Passover with the paschal lamb, it is baked in large, very thin pieces. *Matso*, *matsa*, *motza* are popular forms of the word.

Matsue. Town of Japan, in Honshu. It is in the S.W. of the island, near the W coast, on a narrow strip of land between Lake Shinji-Ko and a sea lagoon, on the banks of a river which connects these sheets of water. Raw silk, ginseng, lacquer, and pottery are the chief products. Pop. 38,000.

Matsumoto. Town of Japan, in Honshu. It is situated on the Central rly, 115 m. W.N.W. of Tokyo, and is a tourist centre for the "Northern Alps of Japan," which lie W. of the town. There is a trade in raw silk. Pop. 36,000.



Matsys. A Money-changer and his Wife, painted by Quinten Matsys in 1518, and now in the Louvre, Paris

Matsuoka, Yosuke (1880-1946). Japanese diplomatist. He was born at Yamaguchi-ken, and educated at Oregon university, U.S.A., where he became converted to Christianity. After 15 years in the Japanese diplomatic service he was appointed secretary to the premier in 1918. Matsuoka was Japanese delegate to the League of Nations, and became foreign minister in 1940. The next year he signed a non-aggression pact with Russia and aligned Japan more closely with the Rome-Berlin axis. He went out of office in July, when the Konoye cabinet was reshuffled. On Jan. 23, 1946, he was arrested in Tokyo as a war criminal, and he died in hospital on June 27.

Matsushima. Group of islets of Japan on the E. coast of Honshu. Matsushima Bay is a small section of Sendai Bay, from which it is separated by the archipelago. The scenic beauties of the pine-clad group, which includes over 800 islands, make it one of the show places of Japan. It is reached from Tokyo by the E. coast rly. to Shiogama. Miyakojima and Sabusawa are the only inhabited islets. Matsushima village occupies almost the middle of the curved coast of the bay.

Matsuyama. Town of Japan, in Shikoku, connected by light rly. with Mitsu, its port, 4 m. to the N.E. on the E. coast of the Inland Sea. Pop. 48,000.

Matsya (Skt. fish). Name of a short-lived union of four Indian states—Alwar, Bharatpur, Dholpur, and Karauli—which was formed March 17, 1948, the maharajah of Dholpur being president. The states were integrated with Rajasthan (*q.v.*) on May 15, 1949.

Matsys OR **MASSYS**, **QUINTEN** (1466-1530). Flemish painter. Born at Antwerp or at Louvain, he was a pupil of either Albrecht Bouts or Schongauer, but the main early influence was that of Dierick Bouts. The chief pictures of his early period are *Madonna and Child* (Brussels), *S. Christopher*, and *Virgin at Prayer* (Antwerp). The painting, *Our Lady of the Seven Sorrows*, at Brussels, is assigned to Matsys, and is supposed to be the large painting made for the Hall of the Guild



Quinten Matsys,
Flemish painter
Etching by L. Girkin

in 1505. The Crucifixion, in the National Gallery, London, is one of many Calvary pictures painted about that date. Of his later works *The Magdalen* and *Madonna Enthroned* are noteworthy. His portraits are remarkable. He painted genre pictures in a satirical vein, *e.g.* a Money-changer and his Wife, 1518 (Louvre). He died at Antwerp.

Mattawa. Town and river of Canada, in Nipissing dist., Ontario. The river is 50 m. long and flows into the Ottawa river at the town, which is on the C.P.R., and is a centre for lumberers, trappers, and sportsmen. Near the town are large deposits of mica. The river forms part of an historic trade route in Upper Ontario. Champlain in 1615 went up the Ottawa and the Mattawa to Lake Nipissing, and his route was generally followed until the advent of the rlys.

Matte. Term used in metallurgy to describe one of the intermediate products of smelting an ore containing sulphides. Formation of a matte implies concentrating the valuable part of the ore into a readily fusible and easily handled mass. It depends on the ability of the various sulphides to mix perfectly with iron sulphide. This intimate mixture is heavier than the slags formed, but lighter than the metal, which will therefore settle to the bottom of a furnace, leaving the matte sandwiched. Mattes dissolve gold, silver, and the platinum metals, and so not only collect the base metals, but also concentrate the precious metals away from the gangue (*q.v.*). Copper ores containing sulphides are smelted in a reverberatory furnace to produce matte, which is subsequently blown in a converter to copper sulphide, the iron being removed as slag, and then to blister copper. If much nickel is present the matte may be cast, the nickel sulphide settling to the bottom of the mould, whence it may be separated when cold and smelted separately from the copper concentrate. In the reverberatory smelting of lead, iron or copper sulphides if present form mattes which dissolve lead sulphide. *See* Smelting.

Mattei, Tito (1841-1914). An Italian pianist and composer. Born May 24, 1841, at Campobasso, near Naples, he studied music in Rome. After teaching there, he settled in London in 1863, devoting himself to conducting, piano-playing, and composing. He made tours in Europe and later returned to Italy.

where he was pianist to the king. His works include operas, *Maria di Gand* among them, ballets, and songs. He died March 30, 1914.

Matter (Lat. *materna*). In philosophy, the quality possessed by all sensible things, more particularly, the material or substance of anything as opposed to its form. Aristotle first accentuated this distinction. He regarded matter as formless, undefined, but capable of becoming everything; it is potentiality as contrasted with actuality. Everything that exists in nature is a possibility that has become an actuality. Thus, the seed is the matter, the potential tree; the tree is the form, the seed in actuality. In later philosophy, matter denotes the visible, palpable material existing in space; more definitely, the persistent, imperishable, foundation or substratum of the world, and all that is in it, as opposed to its changeable phenomena. As to its ultimate nature, according to the atomists it consists of the smallest individual elements; according to the dynamists, of simple movable points endowed with force. The relation between mind and matter is another subject of much controversy. (*See* Aristotle; Kant; Materialism: Mind.)

In physics, three different forms of matter are recognized, the solid, the liquid, and the gaseous. The particular state in which a substance is found is governed by the prevailing conditions of temperature and pressure, *e.g.* air on sufficient cooling and with a suitable applied pressure becomes a liquid or even a solid. To account for this interchange of state, it becomes necessary to invoke an atomic theory of matter. On this theory a molecule of a substance is the smallest part of it which can have a separate existence, and it is made up of a definite arrangement of the atoms of the elements which form the compound. The degree of mutual attraction between these constituent atoms is greatest in the solid state, is less strong in the liquid state, and is so weak in the gaseous state that a gas always tends to occupy the entire space of the largest container.

Rutherford's experiments showed that the structure of the



Tito Mattei,
Italian composer
Histed

atom itself was complex and was to be regarded as consisting of a central core, or nucleus, with an "atmosphere" of revolving electrons. The whole resembling a miniature solar system in which gravitational are superseded by electrical forces. Almost the whole mass of the atom resides in the nucleus, but it is the number of electrons which determine the chemical nature of the atom. (*See* Atom; Mass, etc.)

In medicine matter is sometimes used as a synonym for pus.

Matterhorn (Fr. *Mont Cervin*). Lofty mountain of the Alps. On the frontier of Italy and Switzerland, between Monte Rosa and Mt. Combin, it reaches 14,782 ft., rising abruptly above the range of which it is the sentinel peak. Its glaciers have their upper sources in snows. The Matterhorn was first climbed by Whymper and his party on July 14, 1865; the story of their triumphant ascent and the tragic descent involving four deaths has often been told. The first crossing of the mountain was carried out by J. Tyndall in 1868. Its ascent was later eased by a hut built at a height of 12,526 ft. The N. rock wall was partially climbed in 1934 by the German brothers Schmid, and for the first time completely by a Swiss party in 1946. On the Rosa ridge, 12,000 ft. alt., is a laboratory for studying cosmic rays. *See* Alps illus., p. 339. *Consult also* Hours of Exercise in the Alps, J. Tyndall, 1899; The Englishman in the Alps, A. Lunn, 1912; The Matterhorn. G. Rey, new ed. 1947.

Matthay, Tobias (1858-1945). British pianoforte teacher. Born of German stock at Clapham, Feb. 19, 1858, he studied at the R.C.M. under Sterndale Bennett and Sullivan, and was appointed professor in 1880, a post he retained until 1925. In 1900 he founded his own pianoforte school. His influence was most important on the interpretative side, and in *The Art of Touch*, 1903, he described his system. Among his pupils Myra Hess (*q.v.*) was outstanding. Matthay married Jessie Kennedy (d. 1937), sister of Marjory Kennedy Fraser (*q.v.*). He died at Haslemere, Dec. 14, 1945.

Matthew. Saint and apostle, also called Levi. A Jewish tax-collector for Herod the tetrarch, he was sitting at the receipt of custom near Capernaum when called by Jesus. The First Gospel traditionally embodies his teaching. He is said to have remained in Jerusalem for 15 years after the

Ascension, and to have suffered martyrdom at the hands of the Ethiopians (Matt. 10; Mark 2 and 3; Luke 5 and 6; Acts 1). His call is commemorated by the Anglican Church on Sept. 21, when the R.C. and Greek Churches celebrate his martyrdom.

Matthew, THE GOSPEL ACCORDING TO. Ascribed by tradition to Matthew the Apostle as early as Papias (c. 135), this is a compilation based on two main sources—Mark and the Logia—with some additional material, especially in the opening and closing chapters. It was evidently written for a Jewish audience. The writer never misses an opportunity of introducing an argument from prophecy to prove that Jesus was the Messiah. His quotations are very rarely taken from the Septuagint—a point which proves his acquaintance with the original Hebrew. Jewish customs and practices are often left unexplained, the author assuming that his readers would be familiar with all the national Jewish institutions.

The arrangement and order of the narrative are artificial. The writer groups similar incidents together—giving us chapters of miracles, chapters of parables, and chapters of teaching. There is a strong tradition that the gospel was originally written in Aramaic, but this hypothesis is not now generally accepted. Modern scholars are for the most part inclined to question the theory that Matthew was the author of the gospel as a whole, and to restrict his authorship to the Logia document which was used as its source. Its earliest possible date is 60–70, but many place it ten years later. See *Gospels, The Four*.

Matthew of Paris (d. 1259). English chronicler. He made his confession as a monk at St. Albans, 1217, remaining there for the rest of his life, apart from two visits to Norway about 1248. In his chief chronicle, *Chronica Maiora*, he gives a vivid picture of his times. The *Chronica* is based partly on earlier histories, but its account of the years 1235–59 is the work of Matthew. His *Historia Anglorum* was completed about 1254.

Matthews, FRANCIS EDWARD (1862–1929). British chemist. Born in London, Jan. 31, 1862, he was educated at University College, London, and the Royal College of Chemistry, S. Kensington. He early made a reputation in chemical mathematics, and in 1888 joined the Royal India Engineering College as assistant professor. He is best known for his experiments

in synthetic chemistry, and in 1911 published a paper first suggesting the conversion of neoprene into artificial rubber. He experimented in various polymerising actions and their application to synthetic rubber production. He also made some valuable experiments in the production of ribbon metals. Matthews died Feb. 24, 1929.

Matthews, JAMES BRANDER (1852–1929). American dramatic critic and dramatist. Born at New Orleans, Feb. 21, 1852, and educated at Columbia university, he was called to the bar in 1873, but adopted literature as a profession. He was professor at Columbia university from 1892 to 1924. His books included a number of works on the theatre, and studies of Molière, published 1910, and Shakespeare, 1913. Of his plays, which were suited rather to the study than the stage, the best known is *Margery's Lovers*, 1884. He died March 31, 1929.

Matthews, STANLEY (b. 1915). British footballer. Born at Hanley, Stoke-on-Trent, Feb. 1, 1915, son of Jack Matthews, barber and feather-weight boxer, he joined the ground staff of Stoke City at 15, and in Feb., 1932, signed on with them as a professional. Playing chiefly at outside right, he made it his main function



Stanley Matthews,
British footballer

to provide openings for his inside men, and this he did with artistry and precision. But he was a deadly shot, too (often with the left foot); and his feinting and body-swerving made him a formidable attacker. First included in an international team at 19, he went on to acquire 86 caps by the end of 1957 (including 30 war-time games). Transferred to Blackpool in 1947, he represented them in three Cup finals. Internationally famous, he remained modest in demeanour, and attributed his success to consistent daily training. In 1956 his silver jubilee as a footballer was celebrated by a dinner at the National Sporting Club. He was created C.B.E. in 1957, the first footballer to be so honoured.

Matthews, WALTER ROBERT (b. 1881). British divine. Born in London, he was educated at Wilson's grammar school, Camberwell, and King's College, London.

Matthews was appointed lecturer in philosophy at King's College in



W. R. Matthews,
British divine

1908, and in dogmatic theology, 1909; dean of the theological faculty and professor of the philosophy of religion, 1918. He was chaplain to Gray's Inn, 1920, and to the king, 1925. Celebrated as a preacher and lecturer, when dean of Exeter, 1932–34, he was chosen to succeed W. R. Inge as dean of St. Paul's, 1934. He was created K.C.V.O. in 1935. Matthews's published works include *Studies in Christian Philosophy*, 1921; *God and Evolution*, 1926; *Dogma in History and Thought*, 1929; *Seven Words*, 1933; *Our Faith in God*, 1936; *Teaching of Christ*, 1939; *The Foundations of Peace*, 1942; *Strangers and Pilgrims*, 1945.

Matthias. Saint and apostle. He was chosen by lot (Acts 1) to fill the place among the disciples left vacant by the death of Judas Iscariot. Tradition identifies him with the publican Zacchaeus. His festival is Feb. 24, a red-letter day in the Church of England calendar.

Matthias (1557–1619). Emperor of the Holy Roman Empire. A younger son of Maximilian II, he was born in Vienna, Feb. 24, 1557. Governor of the Netherlands 1578, Austria 1593, and Hungary 1605, he displayed a pacific and tolerant outlook. Recognized heir to the imperial throne, he seized the kingdom of Hungary, also Austria and Moravia, in 1608, and was chosen king of Bohemia in 1611. Elected emperor next year on the death of his brother Rudolph, he soon withdrew from active government. The Thirty Years' War had just opened when he died childless on March 20, 1619.

Matthias Corvinus (1443–90). King of Hungary. Son of John Hunyadi, he was born at Klausenburg (Cluj), March 27, 1443. On the death of his father he was imprisoned in Prague by Ladislas V, but after the latter's death was elected king of Hungary, Jan. 29, 1458.



Matthias Corvinus,
King of Hungary

He undertook a crusade against the Turks, defeated them, cap-

tured Jassy, and drove the Mahomedans from every part of his realm. In 1468, at the command of Pope Paul II, he declared war on George Podiebrad, king of Bohemia. A long campaign followed, during which Matthias was elected king of Bohemia, but the title was never confirmed by the pope, and did not become effective. Matthias carried on a struggle with the emperor Frederick III, and in 1485 entered Vienna, which he made his capital, the whole of S. Austria as far as the Adriatic falling into his hands. He died at Vienna, April 6, 1490. Matthias founded Budapest university and collected a great library.

Matthiesen, AUGUSTUS (1831-70). British chemist. Born in London, Jan. 2, 1831, he became lecturer in chemistry at St. Mary's Hospital, 1868. He made valuable researches into the properties of various alloys, and was the first to isolate calcium and strontium. He committed suicide, Oct. 6, 1870.

Matting. Coarse fabric, made of hemp, fibre, straw, grass, and similar materials, for use as a floor covering, or sometimes for packing and kindred purposes. The principal sources of the European supply are India for coconut and plaited straw matting, and China and Japan for the finer and more closely woven varieties. *See* Coir.

Matto Grosso (Port., dense forest). The second largest state in Brazil. Bordering Bolivia and Paraguay, it is partly a plain, and marshy in the S.W. It is traversed by ranges of low mts. and many rivers, and contains a number of lakes. There are large forested areas in which medicinal plants abound; the state is rich in minerals, silver, gold, lead, iron, platinum, salt, and diamonds being found. Coffee, sugar, tobacco, and maté are produced, rubber is exploited, and cattle are reared. The capital is Cuyaba, but Corumba is the chief commercial centre. Area, 487,500 sq. m. Pop. (1950) 528,451.

Maturin, CHARLES ROBERT (1782-1824). Irish novelist and dramatist. Born in Dublin in 1782, he was educated at Trinity College and entered holy orders. He published his first novel, *The Fatal Revenge*, in 1807 under the pseudonym Dennis Jasper Murphy. It was modelled on Walpole's *Castle of Otranto*, and was followed by other gruesome tales. *Melmoth the Wanderer* (1820) is considered his masterpiece and was greatly praised by Scott. Balzac published a sequel in 1835 under the

title of *Melmoth Reconcilié à L'Église*. He also wrote plays, of which the most notable, *Bertram*, was produced by Kean at Drury Lane in 1816. Maturin died Oct. 30, 1824. His biography by N. Idman was published in 1924. *Consult* Letters to Lady Ewan-Smith, ed. J. Bramforth, 1927.

Matz. River of France, in the dept. of Oise. It is a tributary of the river Oise, starting N.W. of Lassigny and joining that river at Montmacq. *See* Montdidier.

Mau. Two towns of India, in the Uttar union. One lies in the Jhansi dist. and the other in the Azamgarh dist. The first, 117 m. S.W. of Cawnpore, manufactures cloth, and is an important trading centre. Pop. 16,000. The second is 55 m. N. E. of Benares, and manufactures tussore silk. Pop. 30,000.

Maubeuge. Fortress and town of N.E. France, in the dept. of Nord. It is situated on the Sambre, close to the Belgian frontier. Hardware and metal goods are manufactured. The town was besieged in 1793, but was relieved by the battle of Wattignies. It was the capital of Hainault, but became French in 1678. Stevenson describes the town in *An Inland Voyage*. Pop. 20,859.

Strategically, Maubeuge was one of the most important junctions in N. France in the First Great War, five rly. lines meeting there to connect with the French and Belgian coalfields. The fortifications consisted of 15 detached forts, sited 2 to 2½ m. from the town and mounting 435 medium guns. Maubeuge was the advanced base of the B.E.F., and after the Allied retreat large numbers of stragglers joined the French garrison of 30,000. The Germans invested it on Aug. 25, 1914, and after a heavy bombardment it surrendered on Sept. 8. The garrison had twice as many troops as the Germans, and the French commander was court-martialled for his conduct of operations, but acquitted. Maubeuge was reoccupied by the British on Nov. 9, 1918.



Maubeuge arms

Between the wars Maubeuge became one of the points fortified in the expansion towards the W. of the Maginot line, and when the Germans invaded France in May, 1940, it played a vital part in the consequent "battle of the bulge." It formed one end of the salient created in the Allied line, the other end being at Sedan, and fell to enemy storm troops on May 21 after three days of bitter fighting. During the assault the French lost most of the armour concentrated for a general counter-attack against the German advance. Maubeuge was liberated during the rapid Allied advance through N. France in Aug.-Sept., 1944.

Maubin. Dist. and town of Burma, in the Irawadi division. The dist. comprises an inland portion of the great delta, and has almost the densest pop. in Burma. Rice is the chief article of cultivation. The town is a fishery centre, and is built on low ground less than a foot above high-water mark. Area, 1,648 sq. m. Pop.: dist., 428,092; town, 9,000.

Mauch, KARL (1837-75). German traveller. Born at Stetten, Württemberg, May 7, 1837, most of his life was spent in the exploration of Africa. In the course of various journeys he found two extensive goldfields in 1867, and discovered, about 10 m. from Victoria, the remarkable ruins of Zimbabwe, which have been identified by some with Ophir, although it is now agreed that they are of comparatively recent date. He died April 4, 1875. He was the author of *Travels in the Interior of South Africa*, 1872.

Mauchberg. Mountain peak of the Drakensberg chain in S.E. Africa. It is in the Transvaal, alt. 8,700 ft. It is situated 15 m. E. of Lydenburg, and is the highest point in the Transvaal.

Mauchline. Parish and town of Ayrshire, Scotland. It is 9 m. S.E. of Kilmarnock and has a



Mauchline, Ayrshire. Jolly Beggars hostelry, a famous Burns landmark
Valentine

ry. station. Important cattle and horse markets are held, and fancy articles and snuff boxes are manufactured. Mauchline is the scene of Burns's Jolly Beggars and Holy Fair, and 1 m. to the N. is Mossiel, the farm at which the poet lived from 1784 to 1788. Pop. 2,484.

Maud. Poem by Alfred Tennyson. First published in 1855, it was described by its author as "a little Hamlet, the history of a morbid poetic soul, under the blighting influence of a recklessly speculative age." In varied verse the hero records his love for Maud, his acceptance, and then his duel with her brother. Maud dies and the lover, having passed through madness, goes out to fight in the Crimean War. Though unequal, the poem includes some of its author's best remembered lines.

Maud (1869-1938). Queen of Norway. Maud Charlotte Mary Victoria was born Nov. 26, 1869, third daughter and youngest child of Edward VII and Queen Alexandra. On July 22, 1896, she married Prince Charles, son of the then Crown Prince of Denmark.



Maud, Queen of Norway

On Norway's separation from Sweden in 1905, Charles was chosen by popular vote as king of Norway, reigning as Haakon VII, and Princess Maud went with him as his queen. Among more usual accomplishments, she was a talented chess player. Her death occurred in a London hospital, Nov. 20, 1938; her body was taken to Oslo in the British battleship Royal Oak, and laid to rest in the chapel of the castle of Akershus. See Haakon VII.

Maude, AYLMEYER (1858-1938). British author and translator. Born at Ipswich, Mar. 28, 1858, he left Christ's Hospital at the age of 16 to attend the Lyceum at Moscow, and a great part of his early life was spent in that city, first as a tutor and later as a business man. He



Aylmer Maude,
British author
Elliott & Fry

made a close study of Tolstoy, whom he knew intimately and whose works he translated into

English. He also published translations of Turgenev and Dostoevsky, in some of which his wife collaborated with him. In 1897 he helped to arrange the emigration to Canada of the Doukhobors (*q.v.*). His *Life of Tolstoy* in two volumes appeared 1908-1910; he also translated Count Sergius Tolstoy's *The Final Struggle*. He died Aug. 25, 1938.

Maude, CYRIL (1862-1951). British actor. Born in London, April 24, 1862, he was educated at Charterhouse, and studied for the stage under Charles Cartwright. He went to Canada owing to ill-health, and later appeared on the American stage, making his New York debut in 1884. His first London appearance was in *The Great Divorce Case*, 1886, and after joining Wyndham in 1890 he played in *London Assurance* and *The Second Mrs. Tanqueray*, 1893. He went into partnership with Frederick Harrison at the Haymarket, 1896-1905, and in 1907 opened the Playhouse (*q.v.*). One of his most famous parts was that of the title-rôle in *Grumpy*, 1914. He played *Peer Gynt* in a silent film version of Ibsen's play. Later successes included *Lord Richard* in the *Pantry*, 1919; *Aren't We All?*, 1923; *Once a Husband*, 1932. President of the R.A.D.A., 1936, he played *Sir Peter Teazle* in the quarrel scene from *The School for Scandal* at the Haymarket on his 80th birthday, and subsequently broadcast in plays. He published reminiscences, *Behind the Scenes with C.M.*, in 1927, and died at Torquay Feb. 20, 1951. Maude's first wife was the actress Winifred Emery (*q.v.*).



Cyril Maude,
British actor

Maude, SIR FREDERICK STANLEY (1864-1917). British soldier. The son of General Sir F. Maude, V.C., a member of an Irish family, he was born June 24, 1864. Educated at Eton and Sandhurst, he joined the Coldstream Guards, 1884, and in 1885 served in the Sudan. Having passed through the staff college, he joined the staff in 1897. He served in S. Africa, where



Sir Stanley Maude,
British soldier
Swaine

he was in the operations of Lord Methuen's force, and afterwards in the Transvaal: there he won the D.S.O. During 1901-04 he was military secretary to the governor of Canada, after which he was for a time at the War office. Staff officer at Plymouth, 1906-08, he was assistant-director of the territorial force, 1909-12.

When the First Great War broke out, Maude was on the staff of the 5th division, with which he went to France. In Oct., 1914, he was appointed to command the 14th brigade, but soon returned wounded to England. He took command of the 13th division, with which he went in 1915 to Gallipoli, Egypt, and Mesopotamia. In Gallipoli he shared in the withdrawal from both Suvla and Helles. In Aug., 1916, Maude was selected, after the failure to relieve Kut, for the chief command in that area. He reorganized the forces there, and in Dec., 1916, began his advance. The Turks were driven from Kut, and a successful campaign ended in Maude's entry into Bagdad in March, 1917. After a pause for preparation came another forward move, marked by a victory at Ramadie and other successes. Again in Bagdad, Maude was struck down suddenly by cholera, and on Nov. 18, 1917, he died. Parliament voted £25,000 to his widow. A man of tact, patience, and skill, Maude ranks by common consent as one of the successful generals of the First Great War. A crucifix erected in the churchyard of St. Paul's, Knightsbridge, was unveiled to his memory in Jan., 1921, and an equestrian statue in Bagdad in 1922. See Mesopotamia, Conquest of. Consult *Life*, Sir C. E. Callwell, 1920.

Maudit, MONT. Lofty peak of the Mont Blanc mass, between Mont Blanc and Mont Blanc du Tacul. Its alt. is 14,665 ft. The ascent is made from the Glacier du Géant. See Aiguille du Géant.

Maudslay, HENRY (1771-1831). English mechanic. Born at Woolwich, Aug. 22, 1771, he became a blacksmith at Woolwich arsenal, and when 18 was engaged by Joseph Bramah to construct models of his inventions. Later he established his own business as manufacturer of machine-tools. His inventions included the slide-rest, which, with a number of other improvements, revolutionised the lathe, and the first screw-cutting machine. He died Feb. 14, 1831.

Maufe, SIR EDWARD (b. 1883). British architect. Born at Bexley Heath, Kent, he was educated at

S. John's College, Oxford, and after the First Great War he became principal architect to the Imperial War Graves commission. Member of the Royal Academy Replanning Committee, he was awarded the Royal Gold Medal for architecture in 1944. His chief works included Guildford cathedral, buildings for Trinity and S. John's colleges, Cambridge, and S. John's college, Oxford; Morley College, London; the "chapel" in Broadcasting House, London; Festival Theatre, Cambridge; and the churches of S. Saviour's, Acton, and S. Thomas's, Hanwell. He was also architect for the reconstruction of Gray's Inn and Middle Temple, London. He was elected R.A. in 1947, knighted 1954.

Maugham, Frederic Herbert Maugham, Viscount (b. 1866). British lawyer. From Dover College he went up to Trinity Hall, Cambridge, where he was president of the Union and rowed in the university eight, 1888-89. He became a barrister in Lincoln's Inn, 1890, took silk in 1913, and in 1928 was appointed a judge of the high court of justice, in the Chancery division. He was a lord of appeal in ordinary, 1935-38 and 1939-41, receiving a life peerage; from 1938 to 1939 he was lord chancellor. He retired in 1941. He published *The Tichborne Case*, 1936, and several books on Hitler and the Nazis. His brother was Somerset Maugham.



Viscount Maugham,
British lawyer



Somerset Maugham,
British writer

Maugham, William Somerset (b. 1874). British writer. He was born in Paris, Jan. 25, 1874, and educated at King's school, Canterbury, and Heidelberg university. He qualified as a doctor at S. Thomas's hospital, and in his first year of practice wrote *Liza of Lambeth* (1897), the success of which led him to abandon medicine for literature. Many other novels followed, of which the most distinguished were *Of Human Bondage*, 1915; *The Moon and Sixpence* (partially based on the

life of Gauguin), 1919; *Ashenden*, 1928; *Cakes and Ale*, 1930; *Don Fernando*, 1935; *The Razor's Edge*, 1944; *Catalina*, 1948. He also wrote many short stories and books of travel, such as *The Gentleman in the Parlour*, 1930, which reflected his interest in the Far East. Maugham made a considerable name as a dramatist, his witty social comedies, such as *A Man of Honour*, 1903; *Jack Straw*, 1908; *Home and Beauty*, 1919; *The Circle*, 1921; *The Sacred Flame*, 1929, being highly successful. His last play, *Sheppey*, 1933, was a failure, and he announced his intention of writing no more for the theatre.

Maugham was one of the most distinguished writers of his generation, appealing both to the critics and to the larger public. His sense of character was acute and his brilliant wit and narrative ability placed him above almost all novelists of his day. He admittedly owed much to French models (especially, in his short stories, de Maupassant), but everything he wrote bore the mark of his own individuality. In *The Summing-Up*, 1938, he stated his stoical philosophy of life, and explained his own attitude towards literature. He was made C.H. in 1954. *Consult* Lives, R. A. Cordell, 1937; R. H. Ward 1939.

Maui. Polynesian demigod. In the cosmic legends of the Pacific Islands he appears in varying guise, performing exploits which sometimes resemble those familiar in Aryan mythology. Thus, like Hephaestus, he was lame and, like Prometheus, he stole fire for the use of man, either from the sun, from a volcano, or from firesticks cut from trees wherein fire was imprisoned by magical means. In Samoa he became an earthquake god. A Maori legend avers that he fished up the N. island of New Zealand from the ocean floor with a hook made from a jawbone, and elsewhere he is credited with inventing barbed hooks. In Rarotonga he was a son of Tangaroa, whom he supplanted in New Zealand, becoming the supreme sky-god.

Maui. One of the Hawaiian Islands. Situated 26 m. N.W. of Hawaii, it comprises two peninsulas joined by a low neck of shifting sand. The E. peninsula rises to Haleakala (10,030 ft.), with a crater 20 m. round and 2,780 ft. deep. The W. peninsula attains 5,788 ft., with plains to the N. and S. There are large plantations of sugar-cane. Lahaina is the chief town. Area, 728 sq. m. Pop. (1950) 40,440.

Mau Mau. Kikuyu pagan sect, bound together by oaths of secrecy to drive the white man from Kenya. In 1952 it embarked on a campaign of murder, killing and maiming of livestock, robbery, and arson against whites, Indians, and westernised (especially Christian) Africans. Military forces had to be sent to aid the police in rounding up Mau Mau gangs and bringing them to trial. Land hunger, due to the rapid increase in the African pop., was believed by some to be a major cause of the outbreak. *Consult* Mau Mau and the Kikuyu, L. S. B. Leakey, 1952.

Maumbury Rings. Earthwork near Dorchester, Dorset, England, 345 ft. by 333 ft. Built as a sanctuary in the late Neolithic or Bronze Age, it was later adapted as a Roman amphitheatre, its banks being revetted with timber. The arena was 196 ft. by 176 ft. and a den for beasts has been traced. It was used as a gun emplacement in the Civil War, 1642-48.

Mauna Kea (White Mountain). Extinct volcano of Hawaii. It is situated along the N. and N. central portions of the island, and is 13,805 ft. high, the highest peak in the Pacific. Beginning 18,000 ft. below sea level, it is, if this is taken into account, the highest mt. in the world. Its slopes are thickly wooded, and its peaks are covered with snow during the greater part of the year.

Mauna Loa (Great Mountain). Active volcano of Hawaii. In the central and S. portions of the island, it rises from 15,000 ft. below to 13,760 ft. above sea level. It has the largest cubic content of any mt., and discharges the most lava: its lava streams have extended for 50 m. On its S.E. slopes is Kilauea.

Maund, Benjamin (1790-1863). British botanist. Living at Bromsgrove, Worcs, where he kept a stationer's and chemist's shop, he studied botany, and in 1827 was elected a fellow of the Linnean Society, having already produced a periodical, *The Botanic Garden*, in 1825. This, together with other works, was reprinted 1851-54, as *The Botanic Garden and Fruitist*. In 1837 he collaborated with W. Holl in editing the first volume of *The Naturalist*. Maund died April 21, 1863, at Sandown, I.O.W.

Maundy (Lat. *mandatum*, commandment). Name given to the ceremony of washing the feet of the poor on the Thursday before Easter, to the dole then made, and formerly to the Last Supper. The word refers to the words "A new commandment give I unto you,"

spoken by Christ at the Last Supper after He had washed the disciples' feet. The custom of foot-washing on Maundy Thursday was originally kept by noblemen and prelates as well as by the pope and R.C. sovereigns. In England the ceremony, which was performed by the sovereign personally until the reign of William III. when it was transferred to the lord high almoner, was abolished in 1754.

In Great Britain, the Maundy usage remains for gifts of money to be made annually at Westminster Abbey, to as many old men and women as there are years in the sovereign's age, one penny for each year, together with money in lieu of the clothes formerly given. The maundy pennies, first coined under Charles II, are silver and unmilled, and are legal tender. The Yeomen of the Guard carry the doles; the lord high almoner hands them to the sovereign for distribution or, in the absence of the sovereign, dispenses them. The washing ceremony is still observed in several R.C. countries. Maundy Thursday is sometimes called Sheer (formerly meaning pure) or ChareThursday, possibly in allusion to the soul purified by confession.

Maungdaw. Village of Burma, on the Arakan coast at the mouth of the river Naff. It is connected by road with Chittagong to the N., Akyab to the S., and, by a series of tunnels through the Mayu hills, with Buthidaung to the E. Evacuated by the British in the spring of 1942 during the Japanese offensive in Burma, it was reoccupied and evacuated twice, before, at the end of the 1944 monsoon, the British, who had gained control of the Maungdaw-Buthidaung road tunnels in June, secured both places by Dec. 19.

Maunoury, MICHEL JOSEPH (1847-1923). French soldier. He was born at Maintenon, Dec. 17, 1847, and educated at the École Polytechnique, from which in 1869 he entered the army as a lieutenant of artillery. In 1907 he became director of the École Supérieure de Guerre. A general from 1901, he became a member of the war council in 1910. He had retired from the army, but was recalled by Joffre and placed in command of the 6th army, which suddenly fell upon the left of von Kluck in the first battle of the Marne, Sept., 1914. Maunoury was military governor of Paris, 1915-16, and died March 28, 1923.

Maupassant, (HENRI RENÉ ALBERT) GUY DE (1850-1893). French writer. Born at the château

of Miromesnil, Normandy, Aug. 5, 1850, he belonged to an aristocratic family, and entered the civil service. He



Guy de Maupassant

spent much time at the house of Flaubert and there met Daudet, Zola, Turgenev, and other writers. At first he preferred field sports to literature, but after seven years' training as a writer under Flaubert, his career began with the publication in 1880 of a volume of poems, *Des Vers*. When the same year his *Boule de Suif* appeared in *Soirées de Medan*, a collection of short stories by many hands, it established his reputation and confirmed Maupassant in his intention of writing stories.

His first full-length novel, *Une Vie*, appeared in 1883. There appeared in rapid succession some of his most characteristic stories: *Clair de Lune*, *Miss Harriet*, *Yvette*, *Contes et Nouvelles*, and *Monsieur Parent*. One of his best-known works, the novel *Bel-ami*, was published in 1885. With *Mont-Oriol* and *Le Horla* 1887, failing powers and mental hallucinations were evident, though he continued to write such masterly studies as *Pierre et Jean*, 1888; and *Inutile Beauté*, 1890. With the publication of a volume of travels, *La Vie Errante*, 1890, his literary career came to an end.

In spite of robust health and athletic prowess, the inherited mental disorders which led to his brother's death undermined Maupassant's constitution. The "Brittany Bull" found himself entrapped in a Bohemian life which gave him no pleasure, and completed the mischief with drugs and sexual excesses. He died painfully in a private asylum in Paris, July 6, 1893. But in his stories there is a healthy exuberance. He never allowed his rendering of "the humble truth" to be distorted by personal feeling or didactic purpose. His characters are delineated with profound feeling and insight. He remains perhaps the greatest master of the short story.

Bibliography. *La Vie et l'Oeuvre* de G. de M., E. Maynial, 1906; *Souvenirs sur G. de M.*, by his valet, François, 1911. *Lives*, P. Mahn, 1908; J. Rolland, 1924; E. Boyd, 1926; R. V. Sherrard, 1926; S. Jackson, 1938

Maupertuis, PIERRE LOUIS MOREAU DE (1698-1759). French mathematician. Born at St. Malo, July 17, 1698, he served, 1718-23, in the army, where he studied mathematics. He afterwards became a member of the academy of science, of which he was made director in 1742. In 1736 he was given charge of the expedition to Lapland to measure a degree of longitude, and embodied the result of his calculations in *Sur la Figure de la Terre*, 1738. The success of his expedition established his reputation. Settling in Berlin in 1744, he became president of the Prussian academy of science. Having quarrelled with Voltaire, he retired in 1758 to Basel, where he died July 27, 1759. In his *Essai de Philosophie Morale*, 1749, he laid down the theory of pessimism afterwards elaborated by Schopenhauer, Hartmann, and others.

Maurandia (*M. lareliana* and *M. scandens*). Climbing herbs of the family Scrophulariaceae, natives of Mexico. The first named has five-lobed, somewhat ivy-shaped leaves; the second heart-shaped, toothed leaves. Both have tubular violet-purple flowers.

Maurepas, JEAN FRÉDÉRIC PHÉLIPPEAUX, COMTE DE (1701-81). French politician. Born at Versailles, July 9,



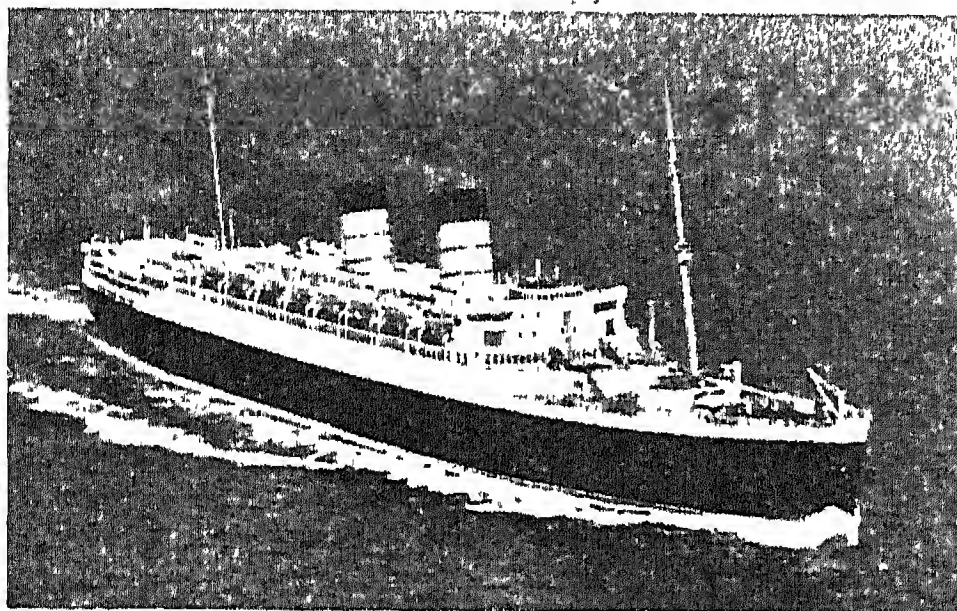
Comte de Maurepas, French politician

1701, he succeeded his father as secretary for the marine in 1724. His naval administration was progressive but he angered Madame de Pompadour in 1749, was exiled from court, and during the remainder of the reign lived in seclusion. On his accession in 1774 Louis XVI took Maurepas into his inmost counsel, but he was a bad adviser at so critical a period, while owing to his jealousy and ambition first Turgot and then Necker were sacrificed. He died Nov. 21, 1781.

Mauretania. Name of two British liners. The earlier launched Sept. 29, 1906, was a sister ship to the *Lusitania* (*q.v.*) and owned by the Cunard Line. Having a displacement of 31,938 tons and a designed speed of 25 knots, she won the blue riband of the Atlantic in 1907, with an average speed of 23.69 knots, a record that stood until broken by the German liner *Bremen* in 1929. This *Mauretania* was broken up in 1935.



The second Mauretania, of 35,677 tons, was launched in 1938 for the Cunard-White Star line. She had a designed speed of 23 knots. Engaged as a troopship during the Second Great War, she re-joined the Atlantic passenger service in 1947. See Launching illus. p. 5009.



Mauretania. Top, first liner of this name, launched in 1906 and broken up in 1935. Below, the second Mauretania, launched in 1938 for the Cunard-White Star line

Mauriac, FRANÇOIS (b. 1885). French writer. He was born at Bordeaux, Oct. 11, 1885, and educated at a Jesuit college. In religious poems, *Les Mains Jointes*, 1910, and in a long series of poignant novels (mainly set in the Landes country), he dealt with the struggle between the material and spiritual worlds. His works include *La Chair et le Sang*, 1913; *Le Désert de l'Amour*, 1925; *Thérèse Desqueyroux*, 1926; *Le Noeud des Vipères*, 1932; *Le Mystère Frontenac*, 1933; *Le Fleuve de Feu*, 1938. An Eng. trans. of his *Life of Jesus* appeared 1937. A play, *Asmodée*, trans. as *The Intruder*, was seen in London, 1939. His literary criticism included a *Life of Racine*, 1930. Elected to the Academy 1933, he received the Nobel prize for literature 1952.

Maurice (1567-1625). Prince of Orange. The second son of William the Silent, he was born Nov. 13, 1567, and was named after his grandfather, Maurice of Saxony. When his father was murdered in 1584, the people of the Netherlands looked to him as their leader,



Maurice of Nassau, Prince of Orange

and one after another the states made him their stadtholder. It is, however, as a soldier that Maurice is best known. He led the Dutch in their war against the Spaniards

gaining victory after victory until the truce in 1609. Many Englishmen gained under him their first experience of war. For religious and other reasons Maurice

fell into a quarrel with his former supporter and friend, Barneveldt, and by using his power secured his execution. He died, April 23, 1625, during the renewed war with Spain.

Maurice (1521-53). Elector of Saxony. Born at Freiberg, March 21, 1521, he succeeded his father in the dukedom of Saxony in 1541. Although he had become a Lutheran in 1539, his ambition led him to help Charles V against the Protestant league of Schmalkalden,



Maurice, Elector of Saxony

1546, in return for which he gained the emperor's assistance in the war against John Frederick, elector of Saxony. The victory of Mühlberg, 1547, gave him the electorate, but, unfaithful to his imperial ally, he joined the Protestant princes and, in 1552, unexpectedly attacked and routed Charles at Augsburg. Maurice proceeded to Hungary to drive back the Turks, but, hastening back to resist an invasion, he was fatally wounded at the battle of Sievershausen, July 9, 1553, and died two days later.

Maurice, SIR FREDERICK BARTON (1871-1951). British soldier. Eldest son of Sir J. F. Maurice (*v.i.*), he was born Jan. 19, 1871, and entered the army in 1892. He served with the Sherwood Foresters in the Tirah, 1897-98, and in the S. African War. In France from

Aug., 1914, he was chief staff officer of the 3rd div. in the retreat from Mons. In Dec., 1915, he was made director of military operations at the War office. After he had written a letter to the press challenging the accuracy of ministerial statements about disasters in France, he was in 1918 placed on retired pay as major-general. Knighted that year, Maurice was principal of the Working Men's College, St. Pancras, 1922-33, and of Queen Mary College, London university, 1933-44. He was president of the British Legion 1932-47. His books include *Forty Days* in 1914, 1919; *Life of Lord Rawlinson*, 1928; *History of the Scots Guards*, 1934; *Life of Lord Haldane*, 2 vols., 1937-38. He died at his home at Cambridge, May 19, 1951.

Maurice, SIR JOHN FREDERICK (1841-1912). British soldier and writer. Born May 24, 1841, a son of John Frederick Denison Maurice (*v.i.*), he was educated at Addiscombe and Woolwich. Entering the Royal Artillery, he saw service in the Ashanti War, 1873-74; in the Zulu War, 1879; and in the Egyptian War, 1882. He became brevet-colonel in 1885 and major-general in 1895. He was professor of military history at the Staff College, Camberley, 1885-92, and died Jan. 11, 1912. Maurice's reputation is chiefly based on the *History of the War in S. Africa*, 1906-10, which he undertook on the death of G. F. R. Henderson.

Maurice, JOHN FREDERICK DENISON (1805-72). British divine and social reformer. The son of a Unitarian minister, he was born near Lowestoft, Aug. 29, 1805, and was educated at Trinity College and Trinity Hall, Cambridge.



J. F. D. Maurice, British divine

Having been ordained in 1834, he became curate of Bubenhall, and in 1837 chaplain of Guy's Hospital, London. He was appointed professor of English literature and history at King's College, London, in 1840, and professor of theology there in 1846.



Sir Frederick Maurice, British soldier
Russell

In 1853, the controversy aroused by Maurice's Theological Essays led to his resignation; and for the next few years he devoted himself to literary work and to the principalship of the Working Men's College, London, of which he was one of the founders, as also of Queen's College for Women. In 1860 he became incumbent of S. Peter's, Vere Street, London; in 1866 professor of moral philosophy at Cambridge; and in 1869 incumbent of S. Edward's, Cambridge. He died April 1, 1872.

Maurice was a colleague of Kingsley in the Christian Socialist movement, an enthusiast for national education, and a friend of all movements for bettering the condition of the poor. Strenuously denouncing party spirit in religion, he stood apart from all parties in the Church, but was bitterly attacked for his alleged heretical teaching on the Atonement and eternal life. His books include *Moral and Metaphysical Philosophy*, 1871-72; *The Claims of the Bible and of Science*, 1863. His *Life* was written by his son, Sir J. F. Maurice (*v.s.*), 1883-84.

Maurists. Reformed congregation of the Benedictine Order named from S. Maurus, a monk associated with S. Benedict. It originated about 1618, when the abbey of S. Maur-sur-Loire was founded near Saumur. A hundred years later there were six provinces in France, including 180 houses, the headquarters being at the abbey of S. Germain-des-Près, Paris. They had the political support of Cardinals de Retz and Richelieu, were famed for their learning, and produced the Benedictine editions of the fathers. The congregation was suppressed in 1792, and the abbey of S. Maur destroyed.

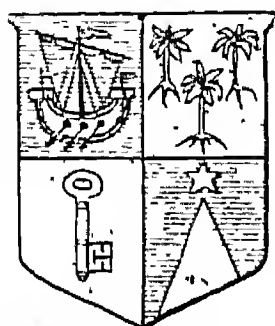
Mauritania OR MAURETANIA. Roman province of North-West Africa. Its area corresponded with that of Morocco and W. Algeria, and it was bounded on the E. by the province of Numidia. The Romans became acquainted with the country during the war with Jugurtha, 106 B.C., and it was formed into a province by the emperor Claudius.

Mauritania. Overseas territory of France in N.W. Africa. Bounded N. by Rio de Oro (Spanish) and lat. 25° N., S. by Senegal, and E. by French Sudan, it was made a protectorate in 1903, a colony 1920, an overseas territory 1946. Boundaries were revised 1945. Area, 323,310 sq. m. Mauritania consists principally of sandy desert, and

the inhabitants are nomad Berbers and Arabs, generally termed Moors. The chief products are gum, salt, and cattle; large flocks of sheep are a principal source of living to nomadic inhabitants. Pop. 497,000.

Mauritia. Genus of palms, natives of tropical America. See Moriche Palm.

Mauritius OR ÎLE DE FRANCE. Island in the Indian Ocean, British crown colony. Situated 530 m. E.



Mauritius arms

of Madagascar, and about 2,300 m. N.E. of the Cape, it is 39 m. long and 29 m. broad, and its area is 720 sq. m. Surrounded by coral reefs, it is a rugged, hilly mass of volcanic origin, the chief heights being Black River Peak, 2,711 ft., and Pieter Both, 2,676 ft., with fairly large valleys of great fertility. It has a heavy rainfall, and the hot, moist climate is generally unhealthy. It exports sugar, molasses, rum, aloe fibre, coconut oil, copra, and vanilla. Port Louis, the capital, has the only good harbour. There is an airport at Plaisance, in Grand Port dist. There are about 80 m. of rly.

Mauritius was discovered by the Portuguese c. 1510; it was then uninhabited, and showed no signs of ever having been peopled. The Portuguese abandoned it, and the Dutch occupied it in 1598, naming it in honour of Prince Maurice of Orange-Nassau. They left in 1710, and five years later the French began to settle; they renamed it Île de France, and brought great prosperity. The British conquered the island in 1810, and it was ceded to Great Britain by the treaty of Paris in 1814, the inhabitants being permitted to retain their laws and religion. Renamed Mauritius by the British, and made a crown colony, it has partially representative institutions, and is administered by a

governor, assisted by a legislative and an executive council, both partly elected, partly nominated.

French and Creole French are still much spoken; English is used in the courts of justice, both English and French in the council of government. The state aids the Protestant and R.C. Churches. Primary education is free, but not entirely compulsory, though literacy is the qualification for the vote. There are an agricultural and a training college, and secondary schools for boys and girls. Pop. (1955 est.) 560,000, of whom more than half are of Indian descent.

An important link in the sea routes to India and the Far East, Mauritius was covered from attack by the Japanese in the Second Great War by British garrisons in Ceylon and Madagascar. Compulsory service for the home guard was introduced in 1941, but no units were sent overseas. When the shah of Persia was deposed in 1941, he was given refuge here.

In literature Mauritius is famous as the scene of St. Pierre's Paul et Virginie, and in ornithology as the one-time home of the dodo. Among the dependencies of the colony, administered by its governor, are Rodriguez Island, the Oil Islands, of which Diego Garcia is the most important, the St. Brandon or Cargados Islands, and the Trois Frères or Eagle Islands, the whole having an area of about 90 sq. m. Pop. (1955 est.) 15,600.



Mauritius. Map of the island in the Indian Ocean, a British crown colony since 1814

Maurois, ANDRÉ (b. 1885). French writer. Born at Elbeuf, of Jewish parents, his real name was Émile Herzog, and he was educated at Rouen. During the First Great War he served as an interpreter, gaining that insight into the British character which appears in his first successful novel, *Les Silences du Colonel Bramble*, 1918, and its sequel, *Les Discours du Docteur O'Grady*, 1920. An Anglophile, he produced fictional biographies: *Ariel* (Shelley) in 1923; *Disraeli*, 1927; *Byron*, 1930; *Dickens*, 1934. Marshal



André Maurois,
French writer

Lyautey was among his French heroes (biography 1931). In 1938 he was elected to the Academy (see illus. p. 54). Maurois lived in the U.S.A. during the Second Great War, and pub. *I Remember, I Remember*, 1942; *Call No Man Happy*, 1943 (both autobiographical). He also wrote histories of England (1917), the U.S.A. (1944), and France (1949).

Maurras, CHARLES (1868-1952). French writer. Born at Martigues, Bouches-du-Rhône, April 20, 1868, he became a journalist on the staff of *L'Action Française*, which he transformed into a royalist journal, and in 1908, in association with Léon Daudet, into a daily paper. In *Trois Idées Politiques*, 1898, and *L'Avenir de l'Intelligence*, 1905, he advocated restoration of the monarchy and formation of a state that would have been later called fascist. A campaign against the R.C. hierarchy caused *L'Action Française* to be placed on the Index during 1926-39, and in 1937 Maurras was imprisoned for incitement to murder the premier, Léon Blum. He pub. *L'Enquête sur la Monarchie*, 1900-09; *Napoléon avec la France ou contre la France*, 1933; *Dictionnaire Politique et Critique*, 5 vols., 1933-34. An academician 1938-45, he wrote literary and other studies, novels, and poetry. He was arrested Sept. 12, 1944, tried as collaborator during the German occupation of France, and condemned Jan. 27, 1945, to solitary confinement for life. Reprieved March 7, 1952, he died at Tours Nov. 16, 1952.

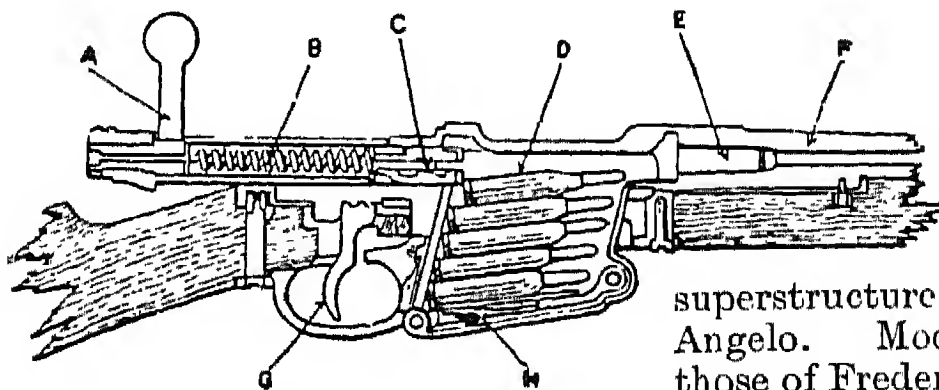
Maury, JEAN SIFFREIN (1746-1817). French prelate. Born at Valréas, Vaucluse, June 26, 1746,



J. S. Maury,
French prelate

he was ordained at Avignon. In Paris his eloquence brought him fame, and he gained the royal favour, being presented to the living of Frénade. Elected to the Academy in 1785, he became a clerical deputy to the states-general of 1789, and proved a staunch champion of Church and king. In 1791 he went to Italy, was made bishop of Nicaea, and in 1794 a cardinal. Louis XVIII, then count of Provence, named him ambassador at the papal court, but, making his peace with Napoleon, Maury returned to France in 1806, and in 1810 was nominated archbishop of Paris. The pope declined to ratify his appointment, which was declared null on the Restoration. On repairing to Rome Maury was imprisoned for six months for contumacy, being released on the sole condition of resigning all his ecclesiastical dignities and preferments. He died May 11, 1817.

Mauser Rifle. Rifle used for both military and sporting purposes, invented by Paul Mauser, a German mechanic. The German government equipped their army with the weapon in 1872, and retained it until the end of the Second Great War. It is also the standard infantry weapon of the Belgian, Spanish, Brazilian, and Turkish, and other armies. It has a bolt action with a charger-loaded magazine. The bolt-head is integral with the bolt, and the locking lugs of the latter are at the forward end close to the cartridge, giving a stronger construction than that of the Enfield. The rifling consists of four grooves, twisting to the right. The rifle is extremely durable, very accurate, and has a long life of barrel. It has

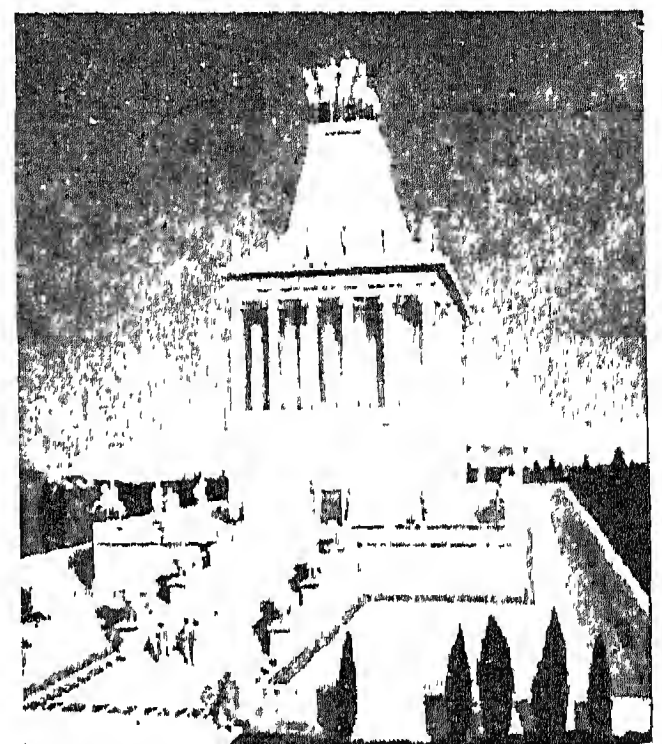


Mauser Rifle. Section showing firing and loading mechanism. A. Bolt head. B. Striker spring. C. Striker. D. Cartridges in magazine. E. Chamber. F. Barrel. G. Trigger. H. Magazine spring

a double pull off like the Enfield. See Rifle.

The Mauser automatic pistol, introduced in 1898, has a clip of 10 rounds in the grip and is made in varying calibres. The .9 mm. model was provided with a wooden holster, which could be attached to form a shoulder-butt, and was sighted up to 1,000 yds. The pistol was adopted as the standard weapon for officers by many Continental and S. American armies, but shortly before and during the Second Great War was largely replaced in the German army by the Luger.

Mausoleum. Name applied to a tomb or cenotaph of unusual size and importance. It was first



Mausoleum. Reconstruction of the tomb of Mausolus at Halicarnassus

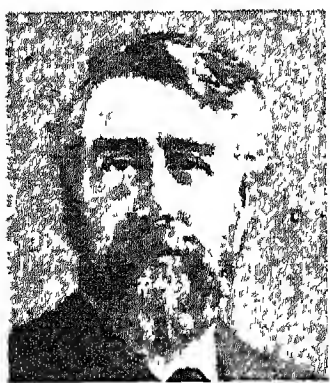
From model by A. J. Stevenson, British Museum, by permission of the Trustees

used of the tomb of King Mausolus of Caria, Asia Minor, erected at Halicarnassus, 353 B.C., of which some of the sculptures are in the British Museum. This monument, accounted one of the seven wonders of the world, was about 100 ft. × 80 ft. and 150-200 ft. high, and was crowned by a colossal statuary group of Mausolus and his wife, Artemisia, standing in a triumphal chariot. Other classic mausoleums were those of Augustus in the Campus Martius, Rome, which was about 280 ft. in diameter, and of Hadrian, Rome, known since the addition of a medieval

superstructure as the Castel Sant' Angelo. Modern examples are those of Frederick William III and Queen Louisa of Prussia at Charlottenburg, of Queen Victoria and the prince consort in Windsor Park, and of Napoleon III at Farnborough. See Halicarnassus.

Mauve. The first synthetic dye used industrially. It was discovered by W. H. Perkin accidentally, while he was trying to make quinine synthetically, in 1856 (English patent 1,934 of 1856), and manufactured at his factory at Greenford. It was used in making the mauve pigment for printing the penny stamps of Queen Victoria; for calico printing; and for whitening skein silk, a use that survives to some extent. Production and manufacture of mauve mark the foundation of the great synthetic organic chemical industry, which supplies not only dyestuffs but explosives, drugs, and other useful products.

Mauve, ANTON (1838-88). Dutch painter. Born at Zaandam, he was a pupil of Pieter Frederik van Os



Anton Mauve,
Dutch painter

of Haarlem and W. Verschuur. In 1870 he settled at The Hague, removing to Laren in 1885. His pictures mostly represent landscapes with cattle and

figures. The National Gallery, London, has a small oil painting, *Watering Horses*, and the National Gallery of Scotland has several examples.

Maverick. Term applied in the cattle-raising districts of the U.S.A. to an unbranded animal found straying. It is derived from Samuel Maverick, a Texan rancher who did not brand his cattle, and, when they escaped, claimed every unbranded animal found in the district. Mavericks are either branded by the owner of the ranch on which they are found, or sold for the common benefit of the ranchers in the district. The word is also used to denote anything obtained fraudulently, as a name for a roving person, and, as a verb, in the sense of "to acquire illegally."

Mavis. Another name of the song thrush or throstle. Formerly in general use in England, the word is in common use in Scotland, and is still met with in poetry.

Mavrocordato, ALEXANDER (1791-1865). Greek statesman. Born at Constantinople, Feb. 11, 1791, a member of a famous Phanariot family, he went at 21 to the court of his maternal uncle, Ioannes Caradja, at Bukarest, and followed that prince into exile. He rendered a supreme service to the cause of Greek independence by seeking to direct to a common



A. Mavrocordato,
Greek statesman

national aim the many different revolts which broke out in 1820-21 against Turkish rule. A principal author of the Greek constitution proclaimed at Epidaurus, Jan. 1, 1822, he successfully directed the national movement for two years. Although the monarchy established by the great powers in 1832 did not fulfil his hopes for Greece, he served successively as minister in Munich, Berlin, London, Constantinople, and in Paris. Recalled in the crisis of 1853, he succeeded in conciliating the European powers and re-establishing peaceful relations with Turkey. He died at Aegina, Aug. 18, 1865.

Mawer, SIR ALLEN (1879-1942). British philologist. Born on May 8, 1879, he was educated at Coopers' Company's grammar school, University College, London, and Gonville and Caius College, Cambridge. From 1905 to 1908 he was lecturer in English at Sheffield university, and was Baines professor of English at Liverpool university, 1921-29, returning to University College as provost in 1930. He was director of the survey of English place-names and wrote many books on that subject. He was knighted in 1937, and died on July 22, 1942.

Mawson, SIR DOUGLAS (b. 1882). A British explorer. Born at Bradford, Yorkshire, England, May 5, 1882, he went in his youth to Australia, where he graduated at Sydney university in 1901, becoming demonstrator in chemistry the following year. In 1903 he carried out a geological exploration of the New Hebrides, and in 1905 was appointed a lecturer in Adelaide university, becoming professor of geology and mineralogy in 1920. On the scientific staff of Sir Ernest Shackleton's Antarctic expedition of 1908, he helped to locate the S. magnetic pole in Victoria Land, and led the Australasian expedition of 1911-14. He discovered and explored King George V Land and was also leader of the British, Australian, and New Zealand expedi-



Sir Douglas Mawson,
British explorer

tion of 1929-31. He published in 1915 *The Home of the Blizzard*. Mawson was knighted in 1914. See *Antarctic Exploration*.

Max, ADOLPHE (1869-1939). Belgian administrator. Born in Brussels, Dec. 31, 1869, he became a journalist, and was dramatic critic for the *Petit Bleu*. He also studied law and accountancy, and in Aug., 1909, after some years as councillor and alderman, he was appointed burgomaster of Brussels.



Adolphe Max,
Belgian administrator

When the Germans approached Brussels on Aug. 20, 1914, he met them and at once began his great battle on behalf of the rights of the Belgian population against the occupying forces. The story is told that the German commander opened an interview by laying his revolver on the desk; whereupon Max placed beside it his only weapon—his fountain-pen. He publicly urged resistance to German demands, and when the fine of £8,000,000 imposed by the Germans on the city of Brussels was not paid he was sent to a prison in Celle, Germany, where he remained until the end of the war. He escaped during the confusion of the German revolution, and on Nov. 17, 1918, was reinstated as burgomaster, holding the post until his death. He was made a minister of state, elected to the chamber of representatives as a Liberal, and received many honours. He died Nov. 6, 1939. Consult Burgomaster Max, A. Vierset and O. E. Millard, 1936.

Maxentius, MARCUS AURELIUS VALERIUS. Roman emperor, A.D. 306-312, a son of Maximian, the colleague of Diocletian. His tenure of imperial power, which he had seized with the help of the praetorian guard, came to an end when he was defeated by Constantine at Saxa Rubra, outside Rome, and drowned in the Tiber in his flight, Oct. 27, 312. See *Constantine*.

Maxilla. Large bone in the upper jaw of most vertebrates. On it are borne, in higher forms, the canine teeth, pre-molars, and molars. It is a membrane bone, overlying and not really forming part of the original cartilaginous upper jaw.

Maxillaria. Large genus of terrestrial orchids. Of the family Orchidaceae, they are natives of tropical America and the W. Indies.

They have slender, leathery, or fleshy leaves. Many have only small flowers, but *M. grandiflora*, *M. sanderiana*, and *M. venusta*, all with white flowers, are larger and more showy.

Maxim, SIR HIRAM STEVENS (1840-1916). American-born British inventor. Born at Sangerville,

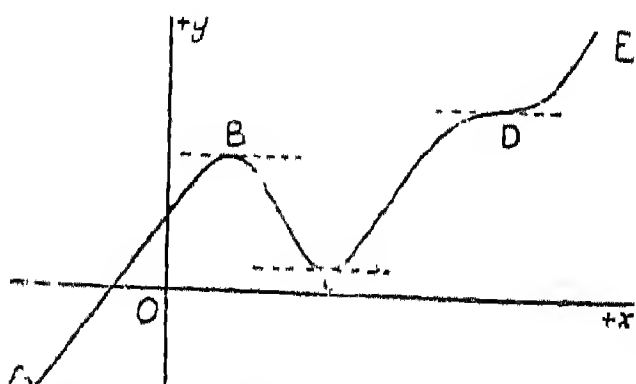


Sir Hiram Maxim,
British inventor

Maine, Feb. 5, 1840, he served an apprenticeship to a coach-builder, afterwards working in a machine shop and a ship-building yard. His inventive faculty developed early, and was demonstrated in improvements in lamps for electric lighting, in gas-generating plants, steam and vacuum pumps, engine governors, steam pumping engines, etc. His name is best known in connexion with the Maxim gun; he was also interested in aeronautics. In 1872 he made a drawing of a proposed helicopter, and in 1894 built a machine which was tried, not very successfully, at Bisley. In 1897 he took out a patent for maxmite, a smokeless powder. Maxim became a naturalised British subject, was knighted in 1901, and died Nov. 24, 1916. He published an autobiography, *My Life*, in 1915.

Maxim, HUDSON (1853-1927). American inventor. Born at Orneville, Maine, Feb. 3, 1853, he was a younger brother of (Sir) Hiram Maxim (v.s.). Hudson studied explosives and ordnance, and was one of the first to make smokeless powder in the U.S.A. His invention was bought by the American government. He died May 6, 1927.

Maxima and Minima. Terms in mathematics that are easier to grasp from a geometrical representation than from a rigorous definition. If the curve ABCDE represents a continuous function $y=f(x)$, then B represents a maximum, C a minimum value of that func-



Maxima and Minima. Curve showing maximum point B, minimum point C, and point of inflection D

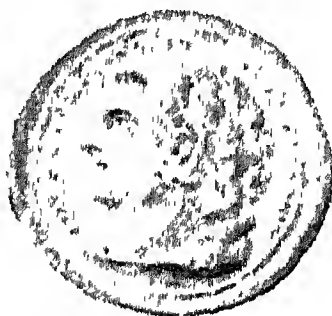


Maxillaria. Example of *M. sanguinea* of Central America, a cultivated specimen
E. J. Wallis

tion. At these points the tangent to the curve is horizontal, so that the derivative of the function $f'(x)$ is zero. A maximum value is greater than any value immediately preceding or following, but not necessarily greater than any value at all (e.g. than at D or E). Similarly for minima. Thus $f(x)$ has a maximum value for $x=a$ if $f'(a)=0$, and $f'(x)$ changes sign from $+$ to $-$ as x increases through a ; it has a minimum value if $f'(x)$ changes sign from $-$ to $+$. If $f'(x)$ does not change sign, the value is neither a maximum nor a minimum, but a point of inflection.

Maxim Gun. Automatic machine-gun. Hiram Maxim saw the early types of machine-gun, such as the Gatling, Nordenfeldt, and Gardner, and being impressed with the possibilities of obtaining more rapid fire by harnessing the waste force of the explosion, designed the gun which has his name. The weapon was adopted by the British army in 1889. See Machine-Gun.

Maximianus I, MARCUS AURELIUS VALERIUS (d. 310). Roman emperor, 286-305. A Pannonian of humble origin, he was chosen by Diocletian as colleague, with the western half of the empire as his portion, and when in 293 the empire was divided into four parts, Maximian had charge of Italy and Africa. When Diocletian abdicated in 305 he compelled Maximian to do the same. In 306 the elevation of his son Maxentius to the rank of Augustus induced him to resume the imperial dignity. In 310, having vainly urged his daughter to murder her husband, he was taken



Maximianus I,
Roman emperor
From a medallion

prisoner near Marseilles by his son-in-law Constantine and killed. Constantine later gave it out that Maximian had committed suicide. A good army commander, but a careless administrator, he was a violent persecutor of Christians.

Maximilian I (1459-1519). German king and Roman emperor. Son of the emperor Frederick III, and so a Hapsburg, he was born in Vienna, March 22, 1459. He married in 1477 Mary, daughter and heiress of Charles the Bold, duke of Burgundy, and the death of Charles in the same year threw on him the duty of defending his wife's lands against numerous aggressors, especially the king of France. This took him into the Netherlands, where he gained his first experience of statecraft. In 1486 he was chosen king of the Romans. He recovered Vienna from the Hungarians, 1490, overthrew the Turks at Villach in 1492, and compelled the king of France to cede Artois and the Franche Comté. He became emperor in 1493.

Maximilian's reign of 26 years was full of incident. He warred against the king of France, with-



Maximilian I,
Holy Roman emperor

out great success, and joined and forsook leagues made by the pope, Henry VII, Ferdinand of Aragon, and other sovereigns. He was continually hampered by lack of means. The Swiss won their independence after a short war in 1499, and no great victories attended his campaigns in Italy. In Germany itself he did something to redress the lack of organization and unity that was the main cause of his military weakness. He set up an imperial court of justice, the Reichskammergericht, and also an aulic council.

The emperor took an interest in military matters, organizing the Landsknechte and improving the fighting forces in other ways. Under him Tirol was added to the family lands, and he arranged the marriages which eventually brought Hungary and Bohemia to the Hapsburgs, and gave a great inheritance to his grandson, Charles V. He was the first to take the title of emperor without being crowned as such by the pope.

Maximilian, a well educated and versatile but restless man, was a writer or inspirer of books, one being an autobiography; also a

dreamer, one theory being that he wished to unite in himself the offices of pope and emperor. He befriended learned men and societies, and from an adventurous strain in his nature has been called the last of the knights. He married a Sforza for his second wife, and died at Wels in Upper Austria, Jan. 12, 1519. He was buried at Innsbruck (*q.v.*). Consult *Life*, I. R. W. Seton-Watson, 1902.

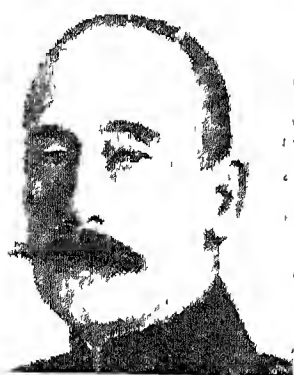
Maximilian II (1527-76). German king and Roman emperor. The eldest son of the emperor



Maximilian II,
Holy Roman emperor
After Mors

Ferdinand I. he was born in Vienna July 31, 1527. He was educated there, but spent some time in Spain. He began to assist his father and his uncle, Charles V, whose daughter Maria he married, in the business of government about 1548, and in 1549 he was recognized by the Bohemians as their future ruler. In 1562 he was chosen king of the Romans by the German electors, and in 1563 elected king by the Hungarians. Having become emperor and king in 1564, Maximilian carried on a short war with the Turks, and was largely occupied in efforts to compose the religious difficulties resulting from the Reformation. He died Oct. 12, 1576.

Maximilian (1867-1929). Prince of Baden and German politician. Born July 10, 1867, a nephew of the grand duke Frederick I, he entered the Prussian army, and rose to the rank of cavalry general. President of the upper chamber of Baden, he delivered a notable speech on the war, Dec. 14, 1917, but was little known in the politics of Germany until on Oct. 3, 1918, he succeeded Hertling as imperial chancellor. His first action was to appeal to President Wilson, through Switzerland, to initiate peace negotiations, and he conducted the difficult questions relating to the armistice and the abdication of the Kaiser. He remained in office until the republican government was fully established. On Nov. 6, 1929, he died in retirement at Constance.



Maximilian,
Prince of Baden

Maximilian (1832-67). Emperor of Mexico, 1863-67. He was born July 6, 1832, a younger son



Maximilian,
Emperor of Mexico

of the archduke Francis Charles and brother of the emperor Francis Joseph of Austria. In 1857 he married Charlotte, daughter of Leopold I, king of the Belgians, and in the same year was appointed governor of Lombardo-Venetia. In 1863, when French troops invading Mexico had captured Puebla, they proclaimed, in agreement with the Mexican clerical party, the archduke Maximilian as emperor of Mexico. He accepted the crown, renouncing his rights as an Austrian prince on doing so, and on May 29, 1864, landed at Vera Cruz.

It was but a section of the Mexican people that recognized Maximilian, and he found himself at war with his new subjects from the first. In 1866 he lost the support of the French force on its return to Europe, and in May of the following year he was betrayed to his enemies and on June 19, 1867, was shot at Queretaro. The empress Charlotte (1840-1927) had gone to Europe to enlist aid and, learning of his fate, went out of her mind, but lived until Jan. 19, 1927. Maximilian wrote *Aus Meinem Leben*, 7 vols., 1867. Consult *Maximilian and Charlotte*, Count Corti, 1928; *Phantom Crown*, B. Harding, 1935; *Mexican Empire*, M. Hyde, 1945.

Maximinus, GAIUS JULIUS VERUS. Roman emperor, 235-38. By birth a Thracian peasant, hence surnamed Thrax, of gigantic stature and immense strength, he rose to high command in the army. He was proclaimed emperor by the legions of the Rhine, and the murder of Alexander Severus within a month made his way clear to the throne. His elevation to the purple marks a stage in the decline of the empire, for he was the first to obtain supreme power without having held a single administrative post, being simply a creation of the soldiery. Maximinus gained some successes



Gaius Maximinus,
Roman emperor
From a medallion

against the Germans, but soon alienated his subjects by tyranny and cruelty, which caused a revolt in Africa. He was murdered by his own soldiers at Aquileia, June 17, 238. See *Balbinus*; *Gordian*.

Maximus, MAGNUS CLEMENS. Roman emperor, 383-88. Born in Spain, he was proclaimed emperor by the troops in Britain, crossed over to Gaul, and defeated Gratian, his rule beyond the Alps being recognized by both Theodosius and Valentinian II. With the design of making himself master of the entire Western empire, he invaded Italy, 387, but was defeated, taken prisoner, and put to death at Aquileia by order of Theodosius.

Maximus, PETRONIUS. Roman emperor in 455. A senator of noble birth, whose wife had been seduced by Valentinian III, he murdered the latter and secured the throne by forcing the widowed empress Eudoxia to marry him. When Eudoxia learnt the truth about her husband's death, she sought the aid of Gaiseric the Vandal, who attacked and plundered Rome. Maximus, while attempting to escape, was cut down by a band of Burgundian mercenaries.

Maximus Tyrannus (ex. 422). Roman emperor, 409-11. When Gerontius, general of the usurper Constantinus (*q.v.*), led a revolt against his master in Spain, Maximus was set up as counter-emperor. After the defeat of Gerontius two years later, Maximus, who had been deposed by Constantinus, in 418 started a fresh rebellion in Spain, but was taken prisoner, removed to Ravenna, and there executed.

Maxixe. Brazilian dance for two people. With something of the character of the tango (*q.v.*), it reached England through Paris in 1913, but did not attain wide popularity.

Max Müller, FRIEDRICH (1823-1900). Anglo-German philologist, Sanskrit scholar, and orientalist. Only son of the poet Wilhelm Müller, he was born at Dessau, Dec. 6, 1823, and studied at Leipzig, Berlin, and Paris. He came to England with an introduction to Bunsen and a recommendation to the East India Company, who commissioned him to edit the *Rigveda*. He be-



F. Max Müller,
Anglo-German
philologist

came professor of modern languages at Oxford, 1854, and of comparative philology, 1866. He died at Oxford, Oct. 28, 1900. His lectures on the Science of Language, 1861-64, simple in style, unlike most German works of the kind, introduced the English public to the latest results of the study of comparative philology and religion. Many of his theories were attacked and are now superseded, but his influence was stimulating at the time. He edited the Sacred Books of the East series, and translated Kant's Critique of Pure Reason. His Autobiography was edited by his son.

Maxstoke Castle. Castellated dwelling-house in Warwickshire, England. Situated E. of Birmingham, between Shustoke and Maxstoke, near to Blyth Hall, the home of William Dugdale, the antiquary, it is an interesting example of the style of architecture adopted by powerful English families, when the feudal castle began to give way to the more comfortable dwelling-house. Begun by William de Clinton in 1345, it has a high embattled wall, with octagonal towers at each angle, a gatehouse with towers commanding the drawbridge, and a moat about 40 yds. wide. Near by are the ruins of a 14th century Austinian priory.

Maxton, JAMES (1885-1946). Scottish politician. He was born June 22, 1885, and educated in Glasgow at Hutcheson's grammar school and the university, becoming a school teacher. An organizer of the Glasgow Federation of the Independent Labour party, he opposed the First Great War and was imprisoned for making seditious speeches. He entered parliament in 1922 as I.L.P. member for Bridgeton, and though a fiery advocate of unpopular causes like republicanism and pacifism, gained respect by his sincerity and disinterest in the fruits of office. Maxton was chairman of the I.L.P., 1926-31 and 1934-39, and published a study of Lenin, 1932.

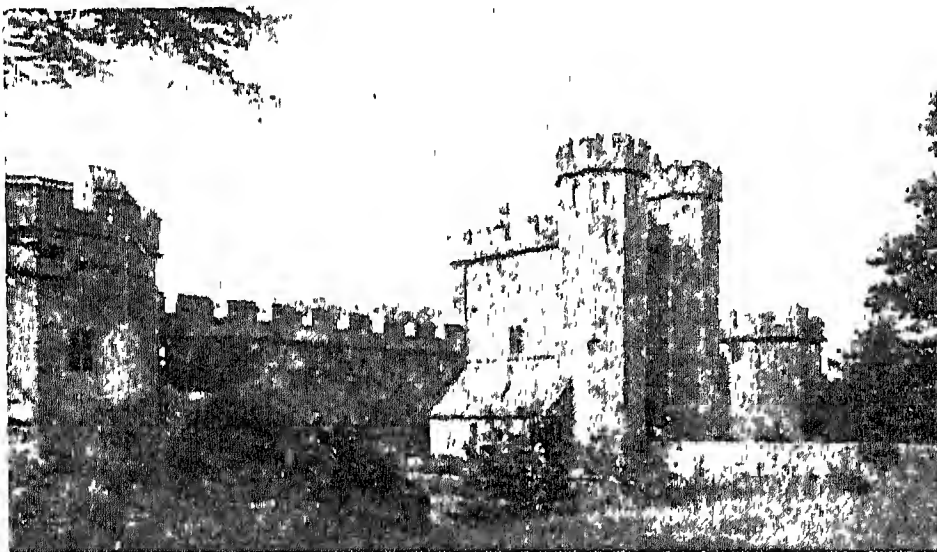


James Maxton,
Scottish politician

If I Were Dictator, 1936. He died at Largs, July 23, 1946.

Maxwell. Unit of magnetic flux. One maxwell per sq. cm. is equivalent to a field of one gauss normal to the area.

Maxwell, SIR HERBERT EUSTACE (1845-1937). British author. The son of Sir William Maxwell, 6th baronet, of Monreith, he was born in Edinburgh, Jan. 8, 1845, and educated at Eton and Christ Church, Oxford. In 1877 he succeeded to the baronetcy, and was M.P. for Wigtownshire 1880-96, being a lord of the treasury 1886-92. He was elected F.R.S. in 1898, and created a knight of the thistle in 1933. Distinguished in many fields of literature, he excelled as a writer on angling. His



Maxstoke Castle. A 14th century dwelling-house, with drawbridge and embattled walls

works include Meridiana, 1892; Sixty Years a Queen, 1897; Salmon and Sea Trout, 1898; British Freshwater Fishes, 1904; The Making of Scotland, 1911; Evening Memories, 1932. He edited the Creevey Papers, 1903. He died Oct. 30, 1937.

Maxwell, SIR RONALD CHARLES (1852-1924). A British soldier. Born Dec. 26, 1852, he joined the Royal Engineers in 1872 and served in the Afghan and S. African wars. In 1909 he was promoted major-general. Early in the First Great War he went to France as inspector-general of communications, and was Q.M.G. to the British forces in France and Flanders, 1915-17. Created K.C.B. in 1915, he became lieutenant-general in 1916, and died July 20, 1924.

Maxwell, WILLIAM BABINGTON (1876-1938). British novelist. Son of John Maxwell, publisher, and M. E. Braddon (q.v.), he grew up in a

literary atmosphere, and after editing one of his father's magazines, published in 1901 his first novel, The Countess of Maybury. His stories were notable for skilful characterisation, generally set in credible but exciting situations. The most successful included The Ragged Messenger, 1904; The Guarded Flame, 1906; The Devil's Garden, 1913; The Mirror and the Lamp, 1918. His last works formed a trilogy, Tudor Green, The Emotional Journey, and Everslade, published under the general title Men and Women, 1935-37. His autobiography, Time Gathered, appeared in 1938, and he died Aug. 4.

Maxwellian Distribution. Conception in physics. The molecules of a gas at a definite temperature may be considered to possess a certain average kinetic energy, but in effect the speeds of the various molecules cannot all be equal, for they are repeatedly in collision and this will tend to abolish any attainment of equality. In the steady state at a constant temperature the distribution of velocities assumes a particular function first deduced by Clerk-Maxwell. This function, giving the probability of a molecule having component velocities, in perpendicular directions, of u, v, w , is given by

$$f(u, v, w) = \frac{(hm)^{3/2}}{\pi} e^{-hm(u^2 + v^2 + w^2)},$$

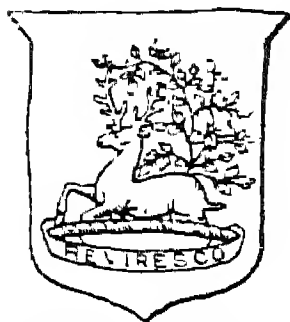
where h is Planck's constant and m is the mass of a gas molecule. Clerk-Maxwell's law indicates that the possibility of a gas molecule having a large kinetic energy falls off exponentially with the value of the kinetic energy.

Maxwelltown. Part of the Scottish burgh of Dumfries. Formerly a Kirkcudbrightshire burgh of barony, it has since 1929 been amalgamated with Dumfries, to which it is linked by four bridges



Maxwelton, Dumfriesshire, scene of the ballad, Annie Laurie. See next page

across the Nith. The chief industries are making woollen underwear, hosiery, and gloves, milk processing, and the repair and manufacture of agricultural implements. Until 1810 the place was known as Bridgend of Dumfries, but it was then renamed, the district being a stronghold of the Maxwell family. The town is dominated by the museum and a Benedictine convent, both on Corbelly Hill. On the outskirts are the fine remains of Lincluden Abbey.



Maxwelltown arms

Maxwelton. Estate in the parish of Glencairn, S.W. Dumfriesshire, Scotland. It is 3 m. E. of Moniaive, and is the Maxwelton of the ballad Annie Laurie. See illus. p. 5593; Laurie, Annie.

May. Fifth month of the Christian calendar. The Latin name *Maius*, connected with *major*, probably signifies the month of growth. The Romans sacrificed to Maia, an old Italian goddess, on the 1st of the month. They considered May an unlucky month for marriages, because the festival of the Lemuria to the spirits of the unhappy dead was held during the month, and this old notion survives in popular superstition.

May. This tree is described under its alternative name of hawthorn.

May. Island of Scotland, in the Firth of Forth, part of the co. of Fife, 5 m. S.E. of Crail. It has remains of a 12th-century priory, and at its highest elevation (160 ft.) there is a lighthouse. Area 2 sq. m.

May, GEORGE ERNEST MAY, 1ST BARON (1871-1946). British financier. He was born June 20, 1871, and went to Cranleigh school. Employed by the Prudential Assurance co. in 1887, he rose to be its secretary. He was manager of the American dollar securities committee, 1916-18. As chairman of the economy committee of 1931, set up by Ramsay MacDonald's second govt., he issued the May report which advised reductions in unemployment benefit and in the salaries of all state servants; it was accepted by some as a masterly survey, but precipitated a government crisis (see Means Test). In 1932 he presided over the import duties advisory committee. Knighted in 1918, and made a baronet in 1931, he was raised to the peerage in 1935. He died April 10, 1946.

May, EDNA. Stage name of Edna May Pettie (1878-1948). American actress. Born at Syracuse, N.Y., Sept. 2, 1878, she appeared on the stage as a child in Gilbert and Sullivan operas, and after studying at New York conservatoire made her reputation in *The Belle of New York*, produced in that city, 1897 and in London 1898. Other musical comedies in which she scored notably were *The School Girl*, *The Catch of the Season*, *The Belle of Mayfair*, and *Nelly Neil*, 1907. On her marriage in 1907 to Oscar Lewissohn she retired from the stage, reappearing in 1911 for one week of charity performances of *The Belle of New York*. She died at Lausanne, Jan. 2, 1948.

May, PETER BARKER HOWARD (b. 1929). English cricketer. Born at Reading, Dec. 31, 1929, he was educated at Charterhouse and (after national service with the R.N.) at Pembroke College, Cambridge, where he was awarded his cricket blue in his first year. He played against Oxford in 1950, 1951, and 1952, and also won his blue for Association football. He first played cricket for Surrey in 1950, becoming county captain in 1957, by which time he was already established as regular captain of the England team. His test-match debut was made with a century against S. Africa in 1951,

and he quickly established himself as a regular England batsman at home, as well as on tour in Australia 1954-55. Succeeding Sir Leonard Hutton as captain, 1956, he led the England team to victory over Australia in that year. This was followed by captaincy in S. Africa, 1956-57, and at home against the W. Indies (again successfully), 1957. Temperamentally as well as technically one of the world's outstanding batsmen, a brilliant fielder, and a shrewd, imperturbable captain, he revealed himself as a superb master of the big occasion, at his very best in a crisis. His highest score (up to the end of 1957). 285 not out for England v. West Indies at Edgbaston,



Peter May,
English cricketer

1957, was made in a second innings, after his side was 288 runs down on the first. He published *Peter May's Book of Cricket*, 1956.

May, PHIL (1864-1903.) British caricaturist. Born at Leeds, April 22, 1864, he was left in great poverty on his father's death in 1873. In 1878 he was assistant scene painter at the Grand



Phil May. "The First Smoke," a typical example of this artist's work

Theatre, Leeds, where he also drew portraits of actors. About 1882 he came to London and drew cartoons for Society and St. Stephen's Review. He then went to Australia and worked for the Sydney Bulletin.

The primitive conditions of printing in vogue there compelled him to develop a style in which everything but absolute essentials was discarded. His work thus attained a brilliant simplicity of line and vividness of character that gave it the appearance of having been achieved by a lucky chance, though each drawing was the result of much labour and many studies. He returned to London about 1890, and worked for the St. Stephen's Review, Pick-me-Up, Pall Mall Budget, The Graphic, for which he travelled in America, the staff of and Punch, on which he succeeded George du Maurier. His publications included The Parson and the Painter, 1891; Gutter-snipes, 1896; and Phil May's Annual from 1892. He died in London, Aug. 5, 1903. A study by J. Thorpe appeared in 1932.



Phil May.
British caricaturist

May, THOMAS ERSKINE. British historian, author of the work on parliamentary procedure popularly referred to as "Erskine May." He was raised to the peerage as Lord Farnborough (q.v.).

Māya (Sanskrit, matter). In the Vedanta philosophy, the veil of Nature which obscures the True. Alternatively, the term signifies a charm-weaver who conjures up visions of the transient glories of this earth in order to captivate Ātma, or the soul. According to the Hindu philosophy all are born in Māya, the conception of which is akin to the Christian's idea of original sin.

Maya OR MAHAMAYA. Mother of Gautama Buddha. Suddhodana, a Kshatriya chief ruling a small state whose capital was Kapilavastu, in S. Nepal, wedded two sisters, Maya and Prajapati,



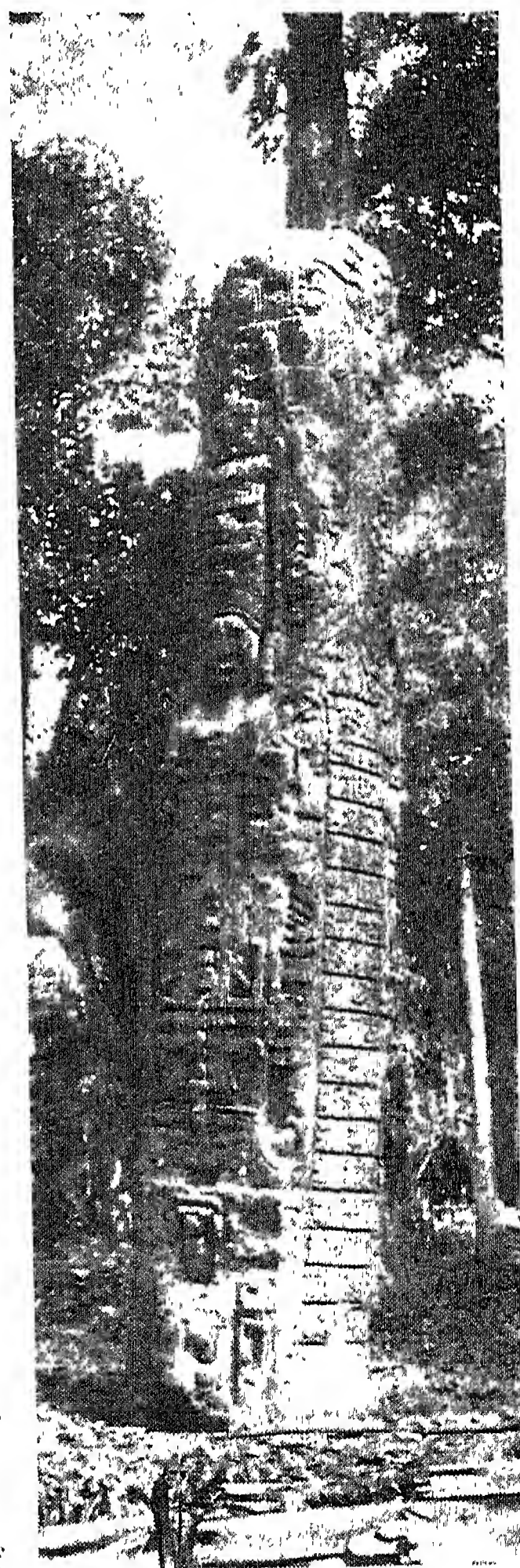
Maya. Divinatory almanac from the Dresden Codex, showing pictures of four gods

whose father Grihapati was a chief of similar rank. The elder sister, when about 45, set out in the second month of spring, c. 560 B.C., for her parents' home in anticipation of childbearing. Midway on the journey she reached a grove sacred to the goddess Lumbini, and here Gautama was born. The sacred grove was visited c. 250 B.C. by Asoka, who erected there an inscribed stone pillar which, in 1895, was identified *in situ* 3 m. N. of Bhagwanpur. In after ages, in emulation of Christian history, the Buddhist nativity became encrusted with legendary features.

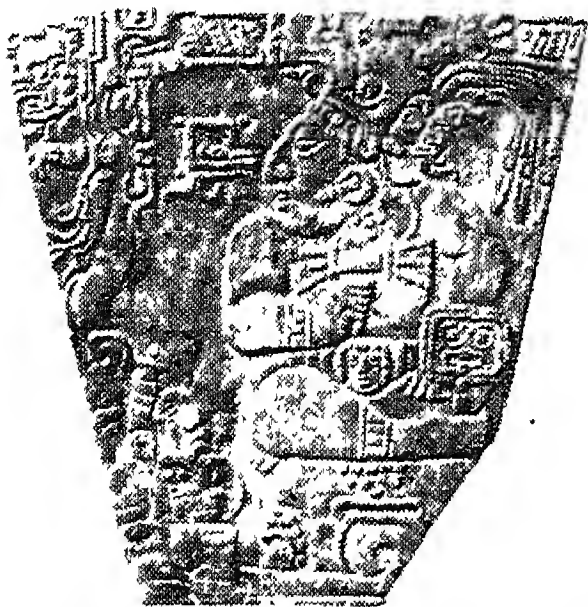
Maya. The Maya are a group of American Indian tribes living in Guatemala, British Honduras, Honduras, and the Mexican provinces of Yucatán, Chiapas, Tabasco, Campeche, and Quintana Roo, and there is a closely related detached group, the Huastec, in Vera Cruz and San Luis Potosí. They speak about 15 different languages within the Maya linguistic stock, and they number in all nearly two million. They are stocky, copper-brown in colour with dark, straight hair, and the men average 5 ft. 1 in. in height. They are exceptionally broad-headed, and this was accentuated in ancient times by artificial deformation of the skull. Today most of them are agricultural peasants. They are thrifty and industrious, clean in their persons, modest, generally peaceable, fatalistic, and either superstitious or religious, according to the point of view of the observer. The ruling classes in ancient times are inferred to have been moderate, tranquil, and disciplined, with a great love of orderly living and deep religious feeling.

The modern Maya are directly descended from a people who

formerly had an advanced civilization, reaching levels of artistic and intellectual achievement unsurpassed in pre-Columbian America. Their origin is obscure, but they probably developed in much the same way as the peoples of central Mexico, from a simple village culture in the first millennium B.C. (see Mexico). They had an



Maya. Classic stela, from Quirigua, Guatemala: it has a priest or god-impersonator on the front, hieroglyphic inscription giving date of erection on the side



Maya. Jade plaque of classic period style, but supposed to have been found at Teotihuacan

elaborate calendar system, but its correlation with the Christian one remains uncertain. According to the chronology generally accepted, the time of their highest civilization (Classic Period) was about A.D. 300-900, and the place the tropical forests in the lowlands of present-day Guatemala and adjacent parts of Mexico and Honduras, with a lesser centre in Yucatán. Some scholars date it about 250 years earlier.

In these areas they raised elaborate ceremonial centres, with great stone-faced pyramids surmounted by masonry temples with roofs supported by beams or corbelled vaults. The exteriors were elaborately decorated with carved stone or painted stucco, but the interiors were small and dark. Other structures included stairways, platforms, and courts for playing a ceremonial ball game. Rectangular columns (stelae) were carved with dignified, impersonal figures of gods or priests, and inscriptions recording the dates they had been set up to commemorate.

All were grouped round courts in an orderly fashion. Notable centres in Guatemala and Honduras were Uaxactún, Tikál, Quiriguá, and Copán, and in Yucatán, Chichén Itzá, and Cobá. Each of these centres seems to have been ruled by members of a learned, priestly hierarchy, and each was supported by the peasants, living on the rich yield of maize plots cleared in the surrounding forests.



Maya. Cylindrical polychrome vase, classic period, from Nebaj, Guatemala

The centres seem to have been independent, and to have maintained peaceful contacts among themselves, with a common religion, sharing their astronomical knowledge. In outlying areas like present-day British Honduras the distinction between peasant and priestly ruler may have been blurred, since there are remains of village settlements with pyramids of modest size.

The Maya worshipped many gods; Itzamna, the chief; sky gods, including the sun, the moon, and Venus; earth gods, the maize, the jaguar, and others; the gods

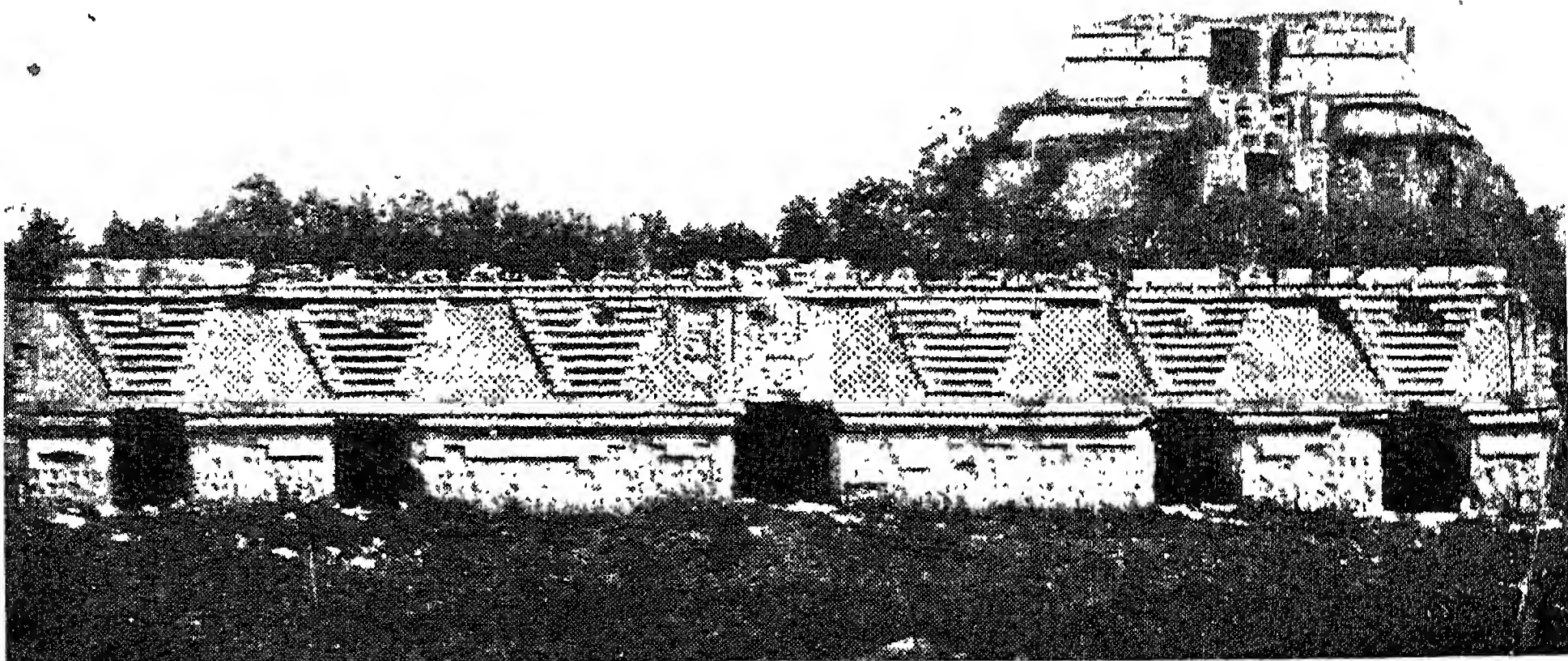
of the underworld; and many others. Many of them had two or four aspects, associated with the cardinal points and their respective colours, white for north, red for east, yellow for south, black for west. The calendar (*see under* Calendar) was an important part of religion, because the days, months, etc., and the numbers associated with them were gods, so a calendrical inscription was a religious document, and the march of time supremely important.

The Classic Maya were a Stone Age people, and their buildings were erected and carved with stone tools. They knew metals, gold and copper, only as imported ornaments at the end of the period. Jade was their greatest treasure, and was skilfully worked by sawing, rubbing, or drilling with string, wooden tools, and sand. They painted hieroglyphic manuscripts on bark paper coated with lime.

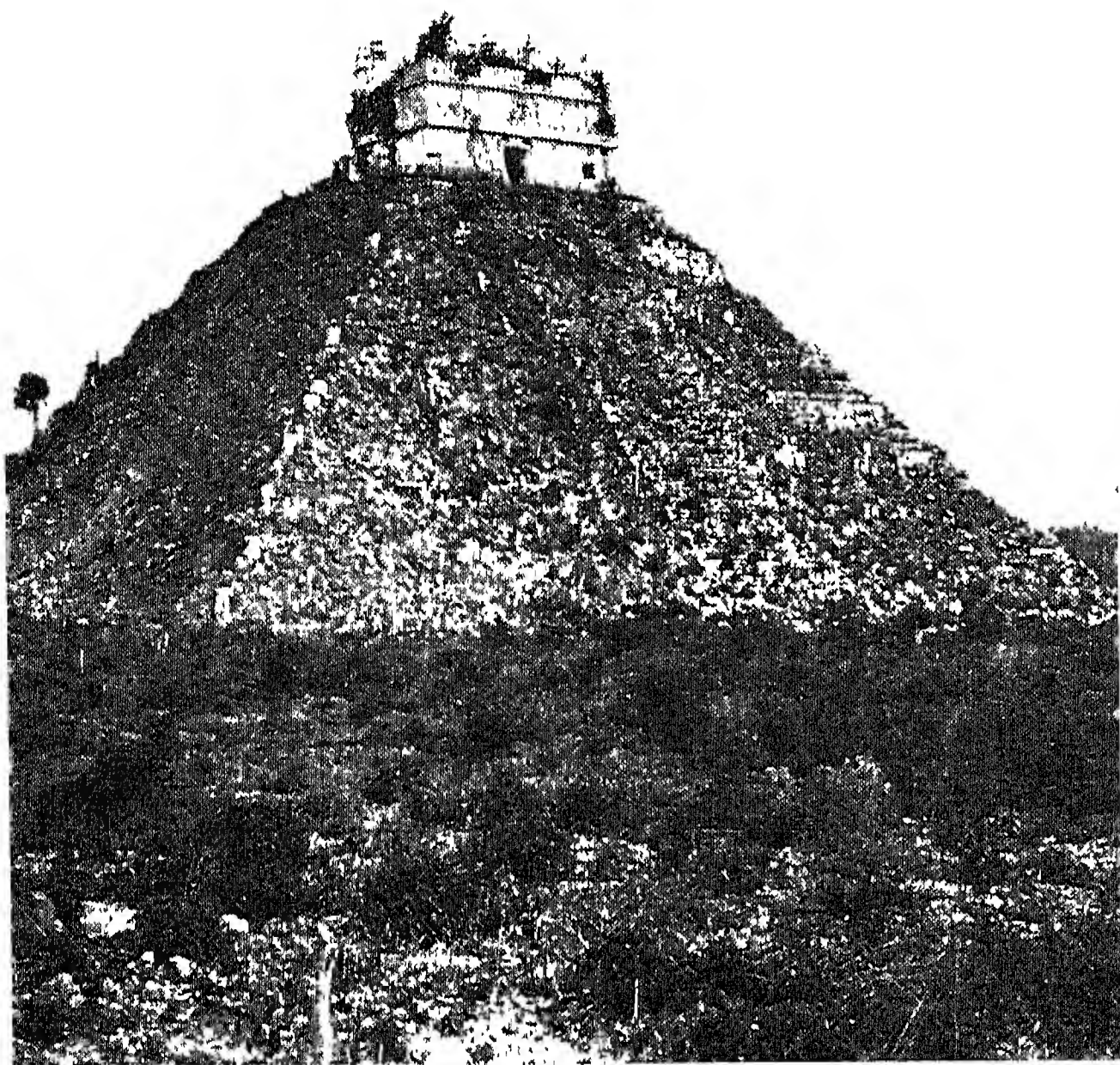


Maya. Polychrome bowl from the Ulua valley

The end of the Classic Period was marked by the gradual abandonment of the southern ceremonial sites, and in the 10th century Yucatán became the main centre. Chichén Itzá was abandoned and reoccupied by people under Toltec influence, who introduced the Feathered Serpent cult, shown in architecture by numerous



Maya. Western façade of nunnery quadrangle at Uxmal, with pyramidal temple of the Magician on the right



Maya. El Castillo, Chichén Itzá, Yucatán, as it appeared before restoration

columns in that form, the exaggeration of human sacrifice, violence, and war. After about 1200 Toltec influence faded, and the rulers of the town of Mayapán overthrew Chichén Itzá and ruled all Yucatán until 1450. The arts were in decadence, and the buildings and pottery of Mayapán were of the poorest quality. After this, Mayapán was overthrown, and small, decadent states fought among themselves until the Spanish conquest of Yucatán in 1541. *Consult* Rise and Fall of Maya Civilization, J. E. S. Thompson, 1956; The Ancient Maya, S. G. Morley, 3rd ed. rev. G. W. Brainerd, 1956.

G. H. S. Bushnell

Mayaguana OR MARIGUANA. Island of the Bahamas. It was leased by Great Britain to the U.S.A. in 1940 for use as a naval and air base. Pop. (1953) 615.

Mayáquez. City of Puerto Rico. The capital of the dept. of Mayáquez, it stands on the river of that name, close to the W. coast. It

has a large and secure harbour, is served by rly., and is a prosperous commercial centre, with trade in coffee, sugar, and fruit, principally oranges. It has an agricultural experimental station. Founded in 1836, Mayáquez became a city in 1873. Pop. (1950) 58,944.

Máyavaram. Town of India, in Madras state, in the dist. of Tanjore. It is a rly. junction on the main line from Madras down the coast, with connexion to Trichinopoly. Pop. (1951) 43,436.

Maybole. Police burgh of Ayrshire, Scotland, 9 m. S.S.W. of Ayr. The chief buildings are the town hall and several churches, and the chief industry the making of boots and shoes. Maybole became important as capital of Carrick. It was incorporated in 1193, and has a castle in which the earls of Carrick lived. Later it passed to the family of



Maybole arms

Kennedy, represented by the marquess of Ailsa. In the neighbourhood are Kirkoswald, famous for its associations with Burns, and Culzean Castle, a National Trust property. Pop. (1951) 4,766.

Maybrick Case. Trial of Mrs. Maybrick for the murder of her husband in April, 1889. Florence Elizabeth Maybrick was then 26, her husband being twice her age. Early in 1889 she formed a liaison with a young cotton broker in Liverpool, and shortly afterwards she and her husband had a violent quarrel. Within six weeks of that quarrel Maybrick was dead, and in that time incriminating correspondence had been intercepted between Mrs. Maybrick and her lover. Maybrick's doctor withheld his certificate; an inquest was held, with the result that the widow was charged with the wilful murder of her husband by arsenic poisoning, a charge made more likely by the fact that a short while before her husband's death she had purchased fly-papers containing arsenic.

The accused woman was defended by Charles Russell, Q.C. (afterwards Lord Russell of Killowen). According to Mrs. Maybrick's own statement, she used the extract of arsenic she made from the fly-papers as a complexion wash, and the chief arguments used in her defence were that her husband was a hypochondriac given to dosing himself with the poison; nor was it certain that arsenic was the direct cause of death. Mrs. Maybrick, found guilty, was reprieved, mainly on the grounds of the conflict of the medical evidence, but despite influential efforts in Great Britain and the U.S.A. she was not released until 1904. After her release she went to the U.S.A. She died at South Kent, Connecticut, Oct. 23, 1941.

May Day. First day of May. The May Day festivities probably originated in the Roman Floralia, the festival in honour of Flora, goddess of flowers. In England flowers and boughs of hawthorn ("may") were brought from the woods, the prettiest girl in the village was crowned with flowers as queen of the may, and the maypole was set up. May Day was the chimney-sweeps' holiday. On the Celtic May Day festival, called Beltane, fires were kindled on the hill-tops. With the rise of the socialist and labour movement in Europe in the 19th century, May 1 came to be observed by the workers as Labour Day.

Mayen. Town of W. Germany, in Rhineland-Palatinate, 16 m.

W.S.W. of Coblenz, with which it is connected by rly., being on the edge of the Eifel Mountains and at the mouth of the Nette Valley. The principal building is a Late Gothic church. Mayen originated as a Roman settlement. In the later Middle Ages it rose again, and in the 13th century, or earlier, was a walled town with a castle. There are some remains of both walls and castle. Pop. 14,000.

Mayence. French name for the city better known by its German name of Mainz (*q.v.*).

Mayenne. River in the N.W. of France. It rises in the dept. of Orne and flows S. across the dept. of Mayenne to join the Sarthe near Angers and form the Maine, which itself soon falls into the Loire. It is navigable for small craft for 75 m., its total length being 125 m.

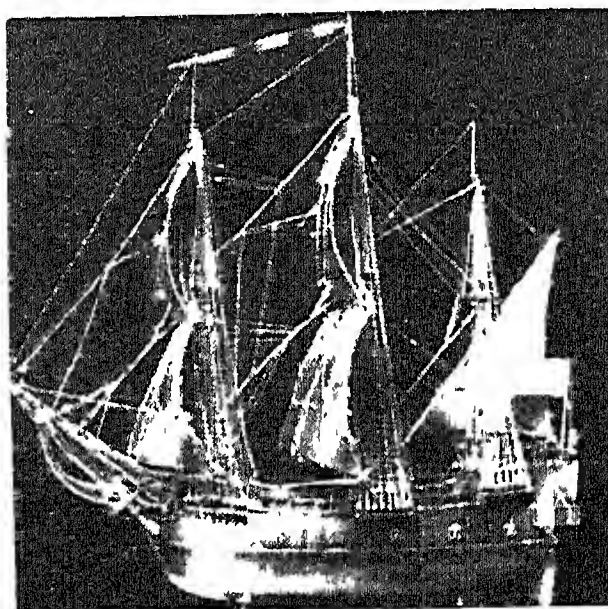
Mayenne. Dept. of France. In the N.W. of the country, the area is 1,986 sq. m. The chief river is the Mayenne; others are its tributaries, including the Jouanne, Colmont, and Oudon. The surface is fairly level, the highest point being under 1,400 ft. high, and the soil is fertile. Cattle, horses, and pigs are reared in large quantities; wheat, oats, barley, and flax are grown, as are apples for cider. A good deal of the land is forest. Laval is the capital; other places are Château Gontier, Mayenne, and Ernée. Before the Revolution the area forming the department was partly in Maine and partly in Anjou. Pop. (1954) 251,522.

Mayenne. A town of France. In the dept. of Mayenne, it stands on the river of that name, being on both banks, 19 m. N.N.E. of Laval. It is a rly. junction, and has manufactures of linen and other textiles. The chief building is the church of Notre Dame; dating from the 12th century, it was partly restored in the 19th. Of the castle, around which the town grew, there are some remains, including the chapel and tower. Mayenne dates from about 1100, and the castle was several times besieged and captured during the various civil wars. In 1573 Charles, a son of the duke of Guise, was made duke of Mayenne, the castle and surrounding territory being then in possession of his family. Pop. (1954) 9,705.

Mayer, JOHANN TOBIAS (1723-62). German astronomer. Born at Marbach, Württemberg, Feb. 17, 1723, he was a self-taught mathematician and entered a cartographic establishment in Nuremberg in 1746, where he gained a considerable scientific reputation.

In 1751 he was elected to the chair of economy and mathematics at Gottingen, becoming superintendent of the observatory three years later. His fame rests chiefly on his lunar tables, 1752 and 1770, of which an amended form was submitted to the British Admiralty. He died Feb. 20, 1762.

Mayer, JULIUS ROBERT VON (1814-78). A German physicist. Born Nov. 25, 1814, in Heilbronn, and educated at the gymnasium there, and at Tübingen, Munich, and Paris, studying medicine, he made a voyage to Java in 1840. There he investigated the phenomenon of animal heat. Taking an interest in science, he practically abandoned medicine, and in 1842



Mayflower. Model of the famous Pilgrim ship of 1620

By permission of Goulding & Co., Plymouth

published his discovery of the principle underlying the conservation of energy, one of the most important principles in physics. In 1845 he published a fuller account of his discovery, and in 1851 his essay on the mechanical equivalent of heat, which was more accurately stated by Joule (*q.v.*). Mayer died March 20, 1878.

Mayfair. District of W. London. Lying to the N. of Piccadilly (*q.v.*), it is covered by once fashionable streets and squares where the aristocracy had their town houses. It derives its name from a fair held during May in the Brook Field, near Chesterfield House. The fair, which originated at the beginning of the 18th century, was suppressed in 1708, revived, and finally done away with in the time of George III. The Tybourne flowed through Brook Field.

What is known as Shepherd's Market, after Edward Shepherd, who built it in 1735, was rebuilt in 1860. Sunderland House is on the site of Mayfair or Curzon Chapel, 1730-1899. Until excommunicated in 1742, the Rev. Alexander Keith ministered here; he then founded another chapel near by at which he

celebrated some 7,000 clandestine marriages. The mews of Mayfair have been turned into garages, and during the Second Great War there was a general evacuation of the district, but though its character is lost, its name remains as a symbol of society. Consult *Looking Back on London*, D. Hood, 1933.

Mayfield. A town of Sussex, England, lying 11 m. S. of Tunbridge Wells. It is served by rly. The church is dedicated to S. Dunstan. The archbishop of Canterbury had a palace, of which there are some remains, partly incorporated in a convent built 1866. The banqueting hall became the chapel. Mayfield was a market town in the Middle Ages, and had an iron industry later. Pop. 3,080.

Mayflower, THE. Sailing vessel in which the Pilgrim Fathers (*q.v.*) left Plymouth, England, Sept. 6, 1620, and reached the shores of Massachusetts, Dec. 21. A square-rigged brigantine, double-decked, broad in beam, with upper works rising high in the stern, the Mayflower had been used in the whaling service. Christopher Jones was her master and part owner. In her cabin, off Cape Cod, Nov. 2, was signed by the pilgrims the famous agreement, drawn up by William Brewster (*q.v.*). See *Jordans; consult The Pilgrims and Their History*, R. G. Usher, 1918; *The Last of the Mayflower*, J. R. Harris, 1920.

May Fly. Popular name for the common English species of ephemera. It appears about the end of May, hence its name, and lives only for a few days, sometimes only a few hours. About 50 species are found in Great Britain, and are in great favour with anglers for bait, especially for trout. See *Angling; Ephemera; Fly-fishing*.

Mayhem. In law, the violent deprivation of a person of a member proper for his defence in fight. It is battery, aggravated by the fact that it ever thereafter disables the injured person from making so good a defence against external injury as he otherwise might have done. Members specified as proper for defence included, besides the hands, arms, and legs, the fingers, eyes, and front teeth, but not the nose, ears, or jaw teeth, which are of no use in fighting. The old penalty for mayhem was retaliation—a limb for a limb—afterwards discarded in favour of fine and imprisonment and payment of damages for the civil injury. Mayhem is now included in the Offences against the Person Act of 1861. See *Battery*.

Mayhew, HENRY (1812-87). British author. Born in London, Nov. 25, 1812, and educated at Westminster school, he was articled to his father, an attorney, for three years. With Gilbert & Beckett he founded the weekly paper *Figaro* in London, 1831-39.



Henry Mayhew,
British author

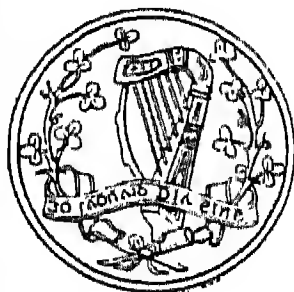
He was joint founder with Mark Lemon and the first editor of *Punch*, and collaborated with his brother Augustus (1826-75) in the production of fairy tales, farces, and popular fiction. His book, *London Labour and the London Poor*, 1851-62, in which he was assisted by John Binny, is almost encyclopedic in scope. He died July 25, 1887.

Maymyo. A hill station of Burma. Situated 30 m. by rly. N.E. of Mandalay, in the dry dist. of Central Burma and at an elevation of 3,500 ft., it was formerly the residence of the British governor of Burma. Maymyo was evacuated by Allied troops in May, 1942, during the Japanese offensive in Burma. Gurkhas of the 19th Indian div. recaptured it by surprise on March 13, 1945. Pop. 8,000.

Maynooth. Village of co. Kildare, Irish Republic. Fifteen m. W. of Dublin, on the rly., it contains the ruins of a castle, formerly the seat of the Fitzgeralds, while near it is Carton, the seat of the present head of that family, the duke of Leinster.

Maynooth is chiefly famous for its R.C. college, founded by the Irish parliament in 1795. The chief Irish college for the education of priests, it has accommodation for 600 students. The building, by A. W. Pugin, is in the Gothic style. The present chapel, with some elaborate decorations, was added later. Until 1871 the college received an annual state subsidy; it was then granted an endowment of £369,040 from public funds.

Mayo. Co. of the Irish Republic, in Connacht prov. It is the third largest in the country; the land area is 2,084 sq. m. It has a long and irregular coastline on the Atlantic, penetrated by Killala, Blacksod, and Clew Bays, Killary Harbour, and

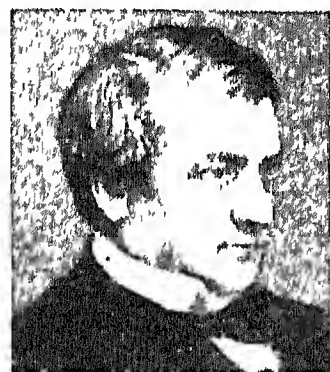


Mayo arms

Broad Haven. The peninsula of Mullet juts out, and in parts the cliff scenery is wild and magnificent. Achill, Clare, Inishturk, and other islands belong to Mayo. It is drained by the Moy, Owenmore, and other rivers; it contains loughs Mask, Conn, Carra, and Beltra. The surface is fairly level in the E., but mountainous in the W., where are Mulreea, Nephin, and other heights of over 2,500 ft. The soil is poor, but cattle, sheep, and pigs are reared, and oats and potatoes grown. Fishing is an industry. Mayo is served by the state rly. Castlebar is the co. town, other places being Ballina, Newport, and Westport. There are remains of religious houses and round towers. The pop., 388,887 in 1841, was 141,896 in 1951. Seven members are elected to the dail.

Mayo, RICHARD SOUTHWELL BOURKE, 6TH EARL OF (1822-72).

British statesman. Born in Dublin, Feb. 21, 1822, he graduated at Trinity College in 1841, travelled in Russia in 1845, and in 1847 became M.P. for co. Kildare. Five years later he became chief



6th Earl of Mayo,
British statesman

secretary for Ireland, holding the post until appointed viceroy of India in 1869. There he introduced financial reforms and much improved the public services, but while calling at the penal settlement of Port Blair, Andaman Is., he was assassinated, Feb. 8, 1872.

Mayo, KATHERINE (1867-1940). Irish-American writer and reformer. Born at Ridgeway, Pa., she wrote on police politics, the Y.M.C.A., and the Philippines. But her most famous book was *Mother India*, 1927, the outcome of a visit to India the previous year. Her exposure of the evils of child marriage caused a sensation on both sides of the Atlantic and helped to move the Indian legislative assembly to reformative action. In 1935 she published *The Face of Mother India*. She died Oct. 10, 1940.

Mayo Association. American medical foundation, started at Rochester, Minn., in 1919 by the brothers Mayo, William James (1861-1939) and Charles Horace (1865-1939). It began with 13 patients but by 1925 the members exceeded 23,000 and its clinic had become world renowned in every branch of surgery. The

brothers founded a graduate school in Minnesota and gave more than £600,000 to establish in Rochester the Mayo Foundation for medical education and research. In the First Great War the Mayos were in joint charge of all U.S. army surgical services.

Mayo College. Indian public school at Ajmer, Rajputana. It was founded on the lines of Eton College for the education of Rajput aristocracy and endowed by the states of Rajputana with the addition of government grants. Named after the 6th earl of Mayo (v.s.), a former viceroy, it was opened in 1875.

Mayor (Lat. *major*, greater). Name given in England and many English-speaking countries to the chief officer of a municipality. It was first used in the early Middle Ages for a high official of any kind. In England the title appeared about 1100 for the chief official of London, and was soon in fairly general use in the chartered towns. The mayor is elected annually by the town council to preside over its meetings and act as the official head of the town. He is the chief magistrate, and is styled his worship. Many large towns now pay him a salary. The corresponding Scottish official is the provost. In France every town, commune, and district has a maire. See Borough; Burgomaster; Lord Mayor; Provost.

Mayor of Casterbridge, THE. Tenth novel by Thomas Hardy. It appeared in 1886, and depicts a group of characters of a county town (Dorchester). Man's conflict against inexorable forces is here shown in the dimensions of man's own experience. The book belongs to the group which includes *Two on a Tower*, 1882, and *The Woodlanders*, 1887.

Mayotte OR MAYOTTA. One of the Comoro group of islands in the Mozambique Channel off E. Africa. It has been a French possession since 1851. The island has an area of 140 sq. m. and a pop. of 17,477. Its former industry of sugar planting has now largely given way to the cultivation of vanilla. During the Second Great War British forces occupied Mayotte on July 2, 1942, as a security measure. See Comoro Islands.

Mayow, JOHN (1640-79). British physiologist and chemist. Born in London, May 24, 1640, he was educated at Wadham College, Oxford. He practised medicine at Bath, making a chemical study of the waters there. His tract on Respiration, 1668, ex-

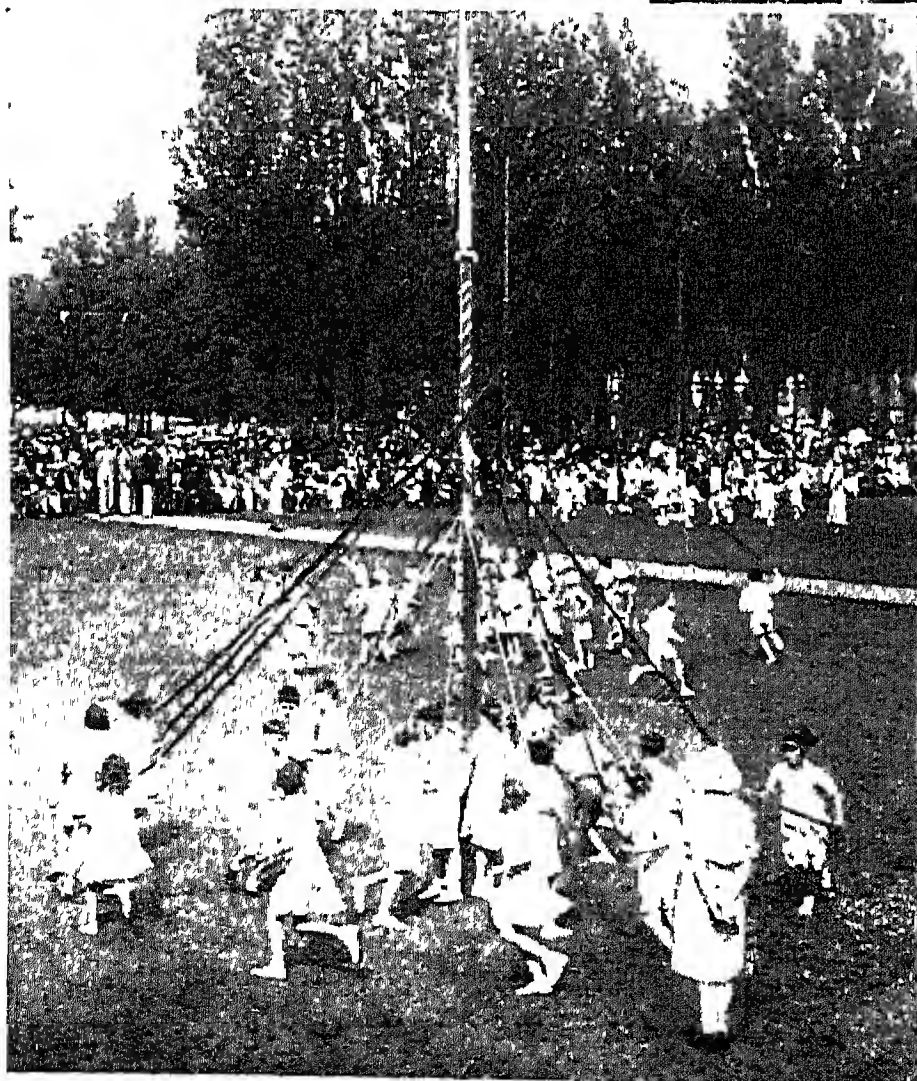
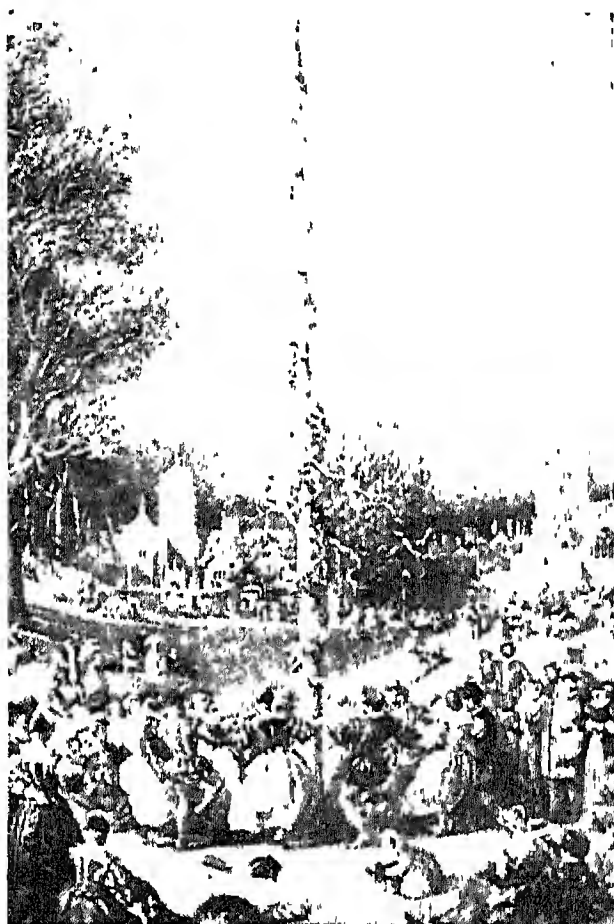
plained the double articulation of the ribs with the spine, and put forward views on the intercostals, developed in *Tractatus Quinque*, 1674. In his treatise *On Saltpetre and the Nitroserian Spirit*, Mayow developed a theory of combustion closely resembling that followed by Lavoisier a century later. He was buried in S. Paul's church, Covent Garden, Oct. 10, 1679. His premature death probably delayed the development of chemistry a hundred years.

Maypole. Tall pole formerly set up on village greens, or in the open spaces of towns in England, to form the centre of the festivities associated with the coming of May. It was garlanded with leaves and flowers, and long coloured ribbons attached to the top were held by dancers, who plaited and unplaited them in the course of their evolutions. The custom was assailed by the Puritans of the 16th and 17th centuries as a survival of ancient idolatry. In some places the maypole was a permanent fixture. The London maypole, demolished by the Commonwealth, was replaced at the Restoration by a pole 134 ft. in height. It stood in the Strand near Somerset House, and was removed to Wanstead, Essex, in 1717. Maypole dances have been revived in many English centres. According to Sir James Frazer, the maypole and all the rites associated with it are a survival of primitive tree worship.

May Report. See Means Test.

Mayu. Name of a river and a range of hills in Burma. The river, some 80 m. long, rises in the Chittagong hills and drains into the Bay of Bengal just N. of Akyab. The hills, which lie close to the Arakan coast, are penetrated by a series of tunnels carrying the road from Maungdaw to Buthidaung, and were the scene of much fighting between British and Japanese, 1942-44.

Mayurbhanj. Former state of India, lying between Bengal to the N.E. and Orissa to the S. and S.E. It was merged in Orissa, 1949. Before the changed constitution of 1947 it was in the Eastern states agency. It entered into treaty relations with the East India Co.



Maypole. Some of the eight maypoles at a children's dance festival at Letchworth, Herts. Top picture, dancing round the maypole in Merrie England, after Joseph Nash

in 1829. Sprung from an ancient Bhanja kingdom, it has notable artistic traditions. A hilly area, it culminates in Meghasani, 3,824 ft. Baripada, the only important town, is on a branch line to the coast rly. Area of state, 4,243 sq. m. Pop. 990,977.

Mayweed (*Matricaria inodora*). Annual or biennial herb of the family Compositae. It is a native of Europe and N. and W. Asia. The narrow leaves are twice divided into thread-like segments. The daisy



Mayweed. White and gold flower-heads

May Week. At Cambridge university, the period in which bumping races between college eights, called the Mays, are rowed on the river Cam. Each college normally enters from one to three crews, and the races are held in several divisions. In spite of its name, May Week lasts only four days and occurs in the first half of June. A social occasion, guests being entertained in the evenings by concerts, dances, etc., it corresponds with Eights Week at Oxford. See Bumping Race.

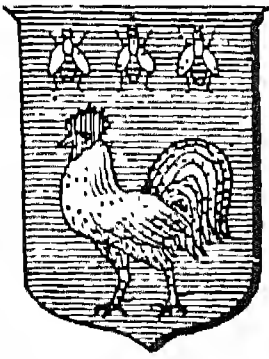
Mazade, FERNAND (1863-1938). French poet. He was born at the château de Monac, Provence, and though in later life he avoided publicity, he became an influence in contemporary French poetry. A supreme lyricist, he excelled alike in classic and romantic verse, and in his symbolist pieces was influenced by Mallarmé. His works include *Athena*, 1912; *Dionysos et les Nymphes*, 1913; *De Sable et d'Or*, 1921. He also compiled an outstanding anthology of French poetry.

Mazagan. Town and seaport of Morocco. It stands on the Atlantic, about 110 miles N. of Marrakesh, for which it is the port. There is accommodation for shipping and a considerable trade passes through here. It has large granaries, and the buildings include a R.C. church. Mazagan owes its origin to the Portuguese, who built it about 1510, and held it until 1770. Pop. 38,000.

Mazama. Volcanic cone in the Cascade Range, S. Oregon, U.S.A. Situated in Crater Lake national park, it is reached by road from Medford, 79 m. to the W., on the Shasta rly. from Seattle to San Francisco. Once it was a great peak with permanent snow and glacier carved valleys, but the top fell in and the hole is occupied by Crater Lake (*q.v.*). The rim of the hole rises in a cliff nearly 2,000 ft. at its highest point above lake level at 6,177 ft.

Mazamet. Town of France. In the dept. of Tarn, it is situated 40 miles from Albi and 12 m. S.E. of Castres, on a rly. from Cette to

Toulouse. The Arnette flows by it. The chief building is the church of S. Sauveur. The manufactures are mainly cloth and leather, with tanning, dyeing, and other attendant industries. Mazamet was in Languedoc until the Revolution, and was known as a Protestant stronghold. Pop. (1954) 17,070.



Mazamet arm:

Mazanderan. Province of N. Persia. It lies between the Caspian and the Elburz Mts. with Teheran prov. to the S. It is a fertile region with a marshy, malarious lake shore, producing silk, wool, cotton, rice, sugar, and fruit. It has a caviare industry, and a considerable trade in horses, donkeys, and mules. while there are deposits of iron and petroleum. The capital is Sari, about 20 m. E. of Babal. The area is about 10,000 sq. m. and the pop. about 200,000.

Mazarin, JULES (1602-61). French statesman and cardinal. He was born at Piscina, July 14, 1602, the son of Pietro Mazarini, a Sicilian in the employment of the Colonna family. Having taken minor orders, he entered the papal service, and was sent to France on a

Jules Mazarin,
French statesman

diplomatic mission. There he attracted the attention of Richelieu, who took him into the French service, 1639, and dying, named him as his own successor in 1642. On the death of Louis XIII in 1643 Mazarin, who had received the cardinal's hat in 1641, retained the confidence of the regent, Anne of Austria, and continued to be first minister. It has been suggested that he secretly married Anne.

Wily and pliant, a strong contrast to his predecessor, Mazarin continued in his own way Richelieu's policy of concentrating control in the hands of the crown. The Thirty Years War was terminated in 1648. The contest between France and Spain was suspended by the internal struggles of France known as the Fronde (q.v.), in which sundry nobles sought to recover their lost ascendancy. This continued until 1653, ending in the complete triumph of Mazarin. The war with Spain was now renewed. Mazarin

procured the alliance of Cromwell, and secured his triumph in the treaty of the Pyrenees, 1659.

Next year the cardinal retired from the active direction of affairs, and died March 9, 1661.

Greedy and dishonest, he had amassed a fortune while leaving the finances in chaos: but he was a patron of Descartes and Corneille. A consummate judge of men, he was an artist in diplomacy, and unswervingly worked for the aggrandizement of France. Consult his Letters, 9 vols., 1872-74; Life, A. Hassall, 1903.

Mazarin Bible. Reputed to be the first complete book printed from movable types (1452-56). So named from its having been discovered in the library of Cardinal Mazarin, it is in two volumes and was printed in Latin at Mainz, probably by Gutenberg or Fust.

Mazar-i-Sherif. A town of Afghanistan. About 10 m. S.E. of Balkh, near the Dehas-rud or Balkh river, it is the capital of Afghan Turkistan, and contains a famous mosque and the shrine of Hazrat Shah. Swords and other weapons are made. Pop. 42,000.

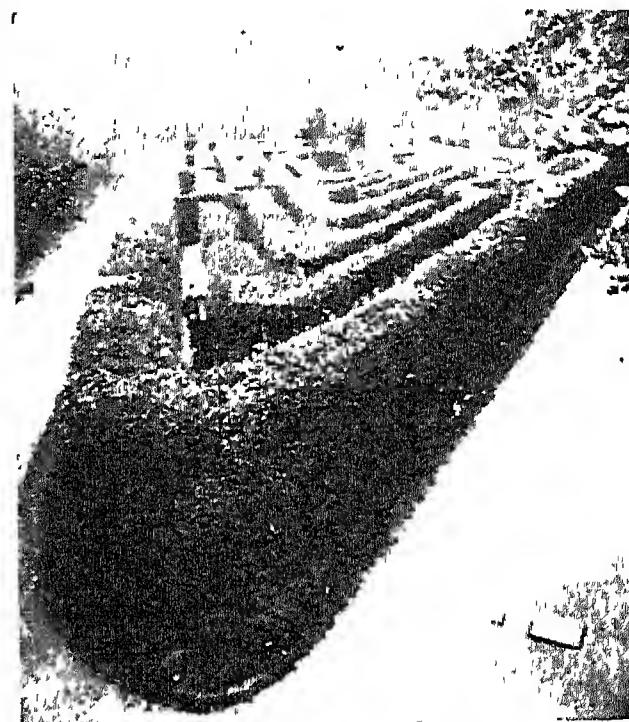
Mazarron. Town of Spain, in the prov. of Murcia, formerly called Almazarron. It is 3 m. from its port on the Mediterranean and 19 m. W. of Cartagena by rly. The neighbouring iron, copper, and lead mines supply its metal works, and it manufactures soap and mills flour. The port has salt works and a coasting trade. Pop. (1950) 9,281.

Mazatlan. City and principal Pacific seaport of Mexico. It is in the state of Sinaloa, at the entrance to the Gulf of California. The harbour is merely an exposed roadstead. Foundry products, cotton, and rope are manufactured; minerals, pearls, fish, rubber, and fruit are exported. With a sub-tropical climate, Mazatlan is popular as a seaside resort. There are good roads to the interior, rlys. to Mexico City and Nogales, U.S.A., and an air service. Pop. (1955 est.) 42,000.



Mazatlan, Mexico. Sea wall and promenade leading to the harbour of this Pacific port

Maze. The modern term for a garden labyrinth or puzzle-garden. There is a notable example at Hampton Court, laid out in the time of William III. Mazes were



Maze. Example at Hampton Court, of mixed hedgerow vegetation

common in S.W. England in former times, e.g. at Pimperne, Leigh, and Troy Town, Dorset. The name of Troy Town is derived from the old British word *troi*, a turning or winding. See Labyrinth.

Mazeppa - Koledinski, IVAN STEPANOVITCH (1644-1709). Cossack soldier. Of a noble Polish family, he was educated by the Jesuits, and was beginning a brilliant career at the court of John Casimir, king of Poland, when he was dis-

Mazeppa-Koledinski,
Cossack soldier

covered in a liaison with a noble lady. The husband bound him naked to a wild horse, which, it is said, fled with him to the Ukraine. His education and ability gained him a reputation with John Samoilovich, the Cossack hetman, whom he succeeded in 1687.

He won the favour of Peter the Great in the war against the Turks, and was employed in the Swedish War in 1704-05; but in 1708 he deserted Peter and took 7,000 men to the assistance of Charles XII. Peter razed to the ground Baturin, Mazeppa's capital, and the hetman lost the allegiance of his Cossacks. He was present at the battle of Poltava,

1709, after which he went to Turkey, and died, perhaps by suicide, at Bender, Sept. 22. The story of Mazeppa has been treated by Byron, Victor Hugo, Bulgarin, and Gottschalk.

Mazo, JUAN BAUTISTA MARTINEZ DEL (c. 1610-67). Spanish painter. Born at Madrid, he was a pupil of Velazquez, whose daughter he married in 1634. He remained with his father-in-law until his death, and succeeded him as court painter in 1661, imitating his work with such skill as to be described as a second-hand Velazquez. Many replicas of portraits ascribed to that master are probably the work of del Mazo. He also copied Titian, Tintoretto, and Paul Veronese. Don Tibureio y Cruzat, in the Prado, is his best work. He occasionally painted hunting scenes, sea pieces, and landscapes, such as his view of the Zaragoza. His portrait of Mariana of Austria (1666) is in the National Gallery, London, where a Portrait of a Man is also attributed to him. He died at Madrid, Feb. 9, 1667.

Mazovia. Region of Poland, otherwise known as Masuria (*q.v.*).

Mazurka OR MASUREK. National Polish dance in triple time. Originating in Mazovia, or Masuria, in the 16th century, the dance was adopted in Russia after the subjugation of Poland, and became popular in Germany in the middle of the 18th century, and in France and England later. Characteristics of the early mazurka tunes were the monotony of the bass—usually a reiteration of the keynote—accents on the third beats of many of the bars, and the finishing on the second beat of the final bar. Chopin lifted the music of the simple folk-dance into the region of art and greatly extended its variety, but his mazurkas still emphasise at times these three features, and the 46th mazurka, Op. 68, No. 1, contains all three in its first phrase given below:



Mazzarà del Vallo. City of Sicily, in the prov. of Trapani. The ancient Mazara, it stands on the coast at the mouth of the river Mazaras, 15 m. by rly. S.E. of Marsala. Its cathedral, founded in the 11th century, was rebuilt in the

17th. The castle dates from 1073. In the neighbourhood are sulphur springs, quarries, and grottoes. Originally a colony of Selinus, Mazara was destroyed in 409 B.C., but again became a prosperous town and fell to Rome after the first Punic war. It exports grain, oil, and linseed. Pop. 22,000.

Mazzeba (Hebrew, thing-set-up). Semitic unhewn pillar-stone. The A.V. translates pillar and image; the R.V. uses pillar throughout. The earliest record (Gen. 28) is Jacob's Beth-el pillar (house of God), whence the Greeks called such stone symbols baityls. Perhaps originally memorials of the dead, they passed into ritual use, as at Beth-shemesh, Gezer, Petra, sometimes with cup-markings. See Menhir; Pillar-worship.

Mazzini, GIUSEPPE (1805-72). Italian patriot and author. Born at Genoa, June 22, 1805, he was



Giuseppe Mazzini

educated for the law, but his love of literature and the coterie of young patriots, of whom he soon became the chief, gave his inclinations a more generous turn in the

direction of politics. He joined the Carbonari (*q.v.*) in 1827, and being arrested on suspicion in 1830 was sentenced to exile. Proceeding to Marseilles, he organized a small band of conspirators, who, in abject poverty and constant danger, spread the doctrines of the secret society, Giovine Italia (Young Italy), already founded by Mazzini.

When, alarmed at his secret politics, the French government

banished him in 1832, Mazzini moved to Geneva, and in 1837 to London, where he made the acquaintance of the Carlyles and gained many friendships of literary and social distinction. Encumbered by poverty, he continued his work of preaching and organizing the cause of Italian unification, stirring the breasts of his fellow-countrymen with passionately eloquent appeals to their patriotism. The revolutions of 1848 recalled him to Italy. From Milan he went to Rome, where he launched the republic, of which he became the leading triumvir, 1849. The French crushed the Roman republic and Mazzini fled back to London to spend the next ten years, broken by one or two furtive visits abroad, at his desk and his propaganda. Intensely distrustful of monarchies, whether in the person of Napoleon III or of Victor Emmanuel, he took as his watchword God and The People.

In 1859 came the Franco-Piedmontese War against Austria, and thousands of Young Italy, headed by Garibaldi, joined Victor Emmanuel's army. Once again the cause of Italian freedom was backed by France, and Mazzini, who had hurried out to Florence, threw himself into conspiracies to thwart Austria, liberate Rome, and drive the Bourbons from Naples. But he was a proscribed man, and after Garibaldi's conquest of the Two Sicilies, and delivery of their crown to Victor Emmanuel, Mazzini made his way back to London. Despairing of unifying Italy under the republic he had planned, he remained a constant opponent of the new order of government, and making his home in Lugano, he continued his plots and conspiracies. In the pursuit of one of these he was arrested in 1870, but was soon released and allowed to settle in Lugano. Refusing the amnesty granted him by the king, he paid visits to Italy, and was at Pisa, under the name of Brown, when he died, March 10, 1872.

It is impossible to overestimate the value of Mazzini's writings in the cause of Italian freedom. An idealist and philosopher, he was useless in action, but his writings, in Italian which became classic in his own lifetime, stirred all that was best in a nation plunged in ignorance and oppression. The moving spirit of the Risorgimento, with Garibaldi, Cavour, and Victor Emmanuel he takes his place among the makers of Italian freedom. He was the selfless idealist inspired by, and inspiring in others,

a sublime devotion to liberty and duty; a patriot who, for the sake of a great cause, spent the main part of his life as an exile. His books are many, but *Il Dovere dell' Uomo*, 1858 (Eng. trans. *The Duties of Man*, 1862), is the best and most characteristic of his essays. Byron & Goethe, 1847, gave an index to his views on literature. His influence in Europe was mostly through writings in his own journals, *La Giovine Italia*, 1832-36; *L'Italia del Popolo*, 1848-51; *Pensiere ed Azione*, 1859-60; *La Roma del Popolo*, 1870-72.

Arthur Hayward

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Mead. Alcoholic beverage made from fermented honey and water. It is often strengthened with brandy and flavoured with hops, currant-juice, etc. Known in classic and medieval times, it was a common drink in both N. and S. Europe. *Metheglin*, from the Welsh *meddyglyn*, is a medicated mead. Made from exhausted honeycomb, mead is still popular among country folk in many parts of England. Forms of it are made in Russia and Abyssinia.

Mead, RICHARD (1673-1754). English physician. Born on Aug. 11, 1673, at Stepney, London, he studied at Utrecht and Leyden and graduated in philosophy and physics at Padua in 1695. His *Mechanical Account of Poisons* was published in 1702 and in the following year he was elected to the Royal Society, contributing a paper on the parasitic nature of scabies. Becoming physician to St. Thomas's hospital in 1703, he was regarded as the head of his profession after the death of John Radcliffe in 1714. He was physician to George II, and died in London, Feb. 16, 1754.

Meade, ELIZABETH THOMASINA (d. 1914). British novelist. She was born at Bandon, co. Cork, daughter

of the Rev. R. T. Meade, rector of Nohaval. She always wrote as L. T. Meade, even after her marriage in 1879 to Alfred Toulmin-Smith. She began writing



L. T. Meade,
British novelist

stories for young people about 1875 and throughout her life was a most

prolific author, particularly known as a writer of popular stories for girls and novels of a sentimental character. Her output of these was regular from 1886 until her death at Oxford, Oct. 26, 1914.

Meade, GEORGE GORDON (1815-72). An American soldier. Born at Cadiz, Spain, Dec. 31, 1815, he graduated from West Point in 1835, and served as an artillery officer against the Seminoles. He resigned in 1836, and took up railway work, but was a staff officer in the Mexican War.

On the outbreak of the Civil War he was appointed a brigadier-general of volunteers; after the second battle of Bull Run he was given a division, and distinguished himself at the battles of South Mountain and Gettysburg. At Fredericksburg (q.v.) he directed the attack on Jackson's corps. Promoted major-general, he was given the command of the fifth federal corps. On the eve of the battle of Gettysburg (q.v.) he was appointed to succeed Hooker, and defeated Lee, after which he conducted a war of manoeuvre, successfully pressing back the enemy. Grant took over the command in 1864, but retained Meade as his chief subordinate. The latter lacked brilliance, but achieved success by his soundness of judgement. He died at Philadelphia, Nov. 6, 1872. A statue at Gettysburg was erected to his memory. *Consult* Life, J. R. Pennypacker, 1901.

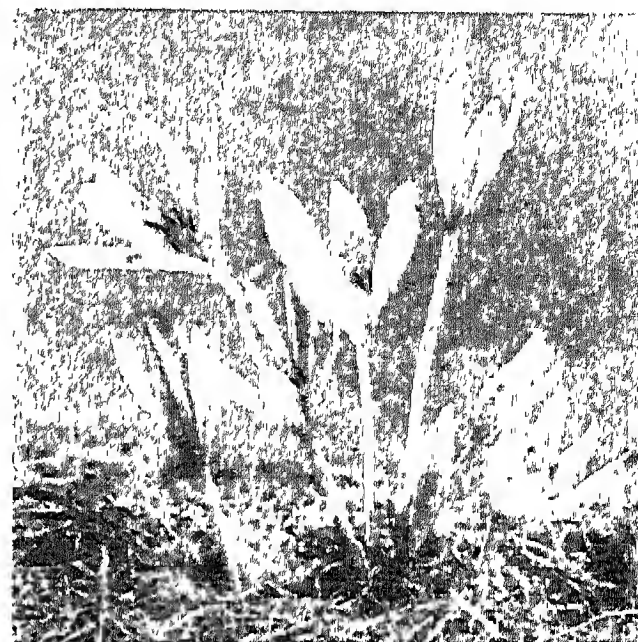
Meadow. Strictly, the name for mown land, laid down for grass and cut for hay. Since such land is commonly grazed after the hay crop has been taken, the word has been extended to grass land reserved entirely for grazing. *See* Grass; Ley Farming.

Meadow Grass (*Poa*). Genus of grasses of the family Gramineae, more particularly *P. pratensis* and *P. trivialis*. The first is a native of the N. temperate and cold regions; the second of Europe, N. Asia, and N. Africa. They are perennials with creeping rootstocks, which send out runners in the first-named species. They have flat pale-green leaves and pyramidal panicles of flowers. *P. nemoralis* grows in copses and woods, not objecting to the shade of trees.

Meadow Rue (*Thalictrum flavum*). Perennial herb of the family Ranunculaceae. A native of Europe and N. Asia, it has a creeping yellow rootstock and furrowed stems 3-4 ft. high. The leaves are divided into numerous three-lobed leaflets. The small

yellow flowers are massed in a large pyramidal cluster. There are no petals and the sepals are small, but the flower-clusters are made attractive by the numerous stamens.

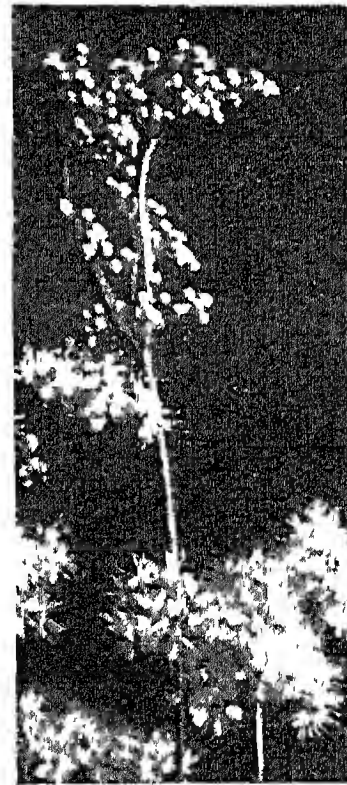
Meadow Saffron (*Colchicum autumnale*). Tuberous-rooted perennial of the family Liliaceae,



Meadow Saffron. Pale purple flowers of this field plant; it is also known as autumn crocus

native of Europe. It has pale purple, crocus-like flowers which appear in autumn; the long slender lance-shaped leaves appear in spring. From the dried corms and the seeds is prepared the alkaloid known as colchicine.

Meadow Sweet (*Spiraea ulmaria*). Perennial herb of the family Rosaceae. It is a native of



Meadow Sweet. Flowers and buds of the fragrant herb

Europe, N. Asia and Asia Minor. It has a short rootstock, from which arise the handsome leaves about 6 ins. long, broken into toothed leaflets and lobes, white and downy on the underside. The flowers are small, creamy-white, in dense clusters, and very fragrant. The plant delights in wet meadows and

water-sides. A popular name for it in some parts of England is queen of the meadows.

Meadville. City of Pennsylvania, U.S.A., the co. seat of Crawford co. On French Creek, 120 m. N. of Pittsburgh, it is served by the Erie and other rlys. The buildings of Allegheny college (founded 1815) furnish classical examples of late American Geor-

gian and Greek Revival architecture; here also is a collection of letters from Thomas Jefferson, James Madison, James Monroe, and John Wesley. Best known industrial products are visual education equipment, rayon, and "zip" (slide) fasteners, mass production of which began in Meadville in 1913, the principle having been patented by a Meadville citizen. Settled in 1788, Meadville was incorporated in 1823, and became a city in 1866. Pop. 16,698.

Meagher, THOMAS FRANCIS (1823-67). Irish politician. Born at Waterford, Aug. 3, 1823, he was educated by the Jesuits at Kildare, and then at Stonyhurst. Settling in Dublin he became a violent advocate of repeal, becoming known as Meagher of the Sword for his advocacy of physical force rather than constitutional methods. One of the founders in 1847 of the Irish Confederation, he embarked on a revolutionary campaign, and in 1848 was arrested and convicted of high treason. The death sentence was commuted to penal servitude for life in Tasmania, but in 1852 he escaped to America, and in 1855 was admitted to the bar in New York. He served in the Northern army in the Civil War, and organized and led the Irish Brigade. Temporary governor of Montana, he was accidentally drowned, July 1, 1867.



T. F. Meagher,
Irish politician

Meal. Word used in two main senses. Originally it meant something ground, hence its present use for the prepared product of oats or maize, the former being oatmeal, while the latter is known in the U.S.A. simply as meal. (See Maize: Oats.) It is also used for the act of taking food in a regular way, breakfast, tea, supper, etc.

Mealies (Dutch *milje*, maize). South African name for the cob which bears the edible part of maize. It is also applied to the whole plant.

Meal Tub Plot. Alleged conspiracy by the Presbyterians in 1679 to dethrone Charles II and re-establish the Commonwealth. It had no existence outside the brain of the informer Thomas Dangerfield, who, when charged with imposture, endeavoured to save himself by declaring that the supposed conspiracy was a fabrication of the R.C.s to hide a Popish

plot for the subversion of the state. The whole affair took its name from the meal tub in the house of a Mrs. Cellier in which, according to Dangerfield, the incriminating papers were to be found. Mrs. Cellier and Lady Powys were brought to trial but acquitted, and Dangerfield was killed by a spectator on his way back from the pillory at Tyburn.

Meal Worm. Popular name for the larva of a small beetle, *Tenebrio molitor*, which infests granaries and mills. The larva is over an inch long, and is yellow, with darker bands. It is reared as food for cage birds and small reptiles. The beetle is black or brown above and reddish brown below. See Beetle.

Mean. In ordinary language, that which occupies a place midway between two extremes. In ethics, the term golden mean is used for that balance between the extremes of excess and deficiency, which constitutes the essence of virtuous action. Thus, truthfulness is the mean between boastfulness and excessive modesty of speech, bravery between fear and excessive self-confidence. In Plato the "mean" of Aristotle appears as moderation, the application of the principle of the finite (limit, proportion) to the infinite (desires and passions). In logic, the mean is the middle term of the syllogism.

In mathematics, a mean is a term interpolated between two other terms of a series. If a and b are two terms of a series, then their arithmetic mean is $(a + b)/2$, their geometric mean is \sqrt{ab} , and their harmonic mean is $2ab/(a + b)$.

In astronomy the word is used in the phrases mean sun, mean moon, mean longitude, etc. In this sense it signifies an imaginary sun, moon, or planet, the movements of which are uniform. e.g. the mean moon is a moon which moves round the earth with uniform velocity in the same time as the actual moon does.

Meander. An Eng. form of anc. Gr. Maiandros, name of a river of Phrygia, the mod. Mendere. Term applied to the swinging curves developed by rivers flowing on nearly level flood-plains, from the nature of the Maiandros. Because the velocity of the water is greater on the outside and downstream sides of the curves than on the insides, rivers tend to undercut their concave banks and to deposit material on the insides of curves. This causes meanders to change their shape and position continually, and where parish or county boundaries have been fixed by the

course of a meandering stream such shifts in the channel become of legal or economic importance. If a river breaks through from one meander to the next a complete curve may be cut off, and an oxbow lake (q.v.) formed.

Incised meanders are formed when the river having developed a meandering course becomes capable of cutting its bed downwards again. The valley thus formed is steep-sided and gorge-like in cross-section, but its plan is that of the original winding meander pattern.

Mean Sea Level. Value derived from a long series of observations made at equal intervals of time. Considerable fluctuations occur in sea level, owing to waves, swell, tides, etc., but the mean value at any place is constant for all practical purposes. The sea at Newlyn, Cornwall, which is exposed to the Atlantic, provides the datum upon which Ordnance Survey maps are based. Previously, the level assumed at Liverpool, about one inch higher than at Newlyn, was the standard. Measurements of height on land are often referred to mean sea level. Barometric pressure is generally reduced to the value which the observer would read if situated at sea level.

Mean Solar Time. Method of reckoning the length of a day. The average interval of time is taken from the instant the sun reaches the meridian to the moment when the revolution of the earth brings the sun again into the same position. The time indicated by a sundial, called apparent solar time, does not agree with mean solar time, for the length of the actual solar day varies for two reasons: the earth's orbit is elliptical, and the plane of the equator does not coincide with that of the ecliptic.

To obtain a constant measure of time, the apparent solar day is ignored and a purely arbitrary unit has been established. The zero adopted for mean solar time is the instant when a fictitious body, known as the mean sun, sometimes in front and sometimes behind the actual sun, is on some chosen meridian. This gives the local solar mean time of any place through which that meridian passes and the time of that meridian is used throughout a whole country (see Greenwich Mean Time). When determined by local observation, mean solar time is true only for places on the same meridian. To overcome variations, which in certain places are as much as a minute for every 10 miles on the earth's surface, most countries

have established time zones, approximately 15° of longitude wide throughout each of which a standard time is observed. *See* Time.

Means Test. Term used in Great Britain for the investigation of an applicant's resources before the granting of aid. Such an investigation was part of the Poor Law administration, and was made under the Old Age Pension Act, 1908. The idea of a means test also underlay the National Insurance Act of 1911 and subsequent amendments (up to 1946), the application of which was limited to persons whose income was below a certain figure. A means test is, or has been, applied to those seeking to take legal action as poor persons; to the parents of a single man enlisting in the armed forces if he wants an allowance to be made to them; to patients in hospitals; to parents claiming allowances for children who have won scholarships, etc. The term was used in particular, however, of the test imposed during the 1930s on those among the unemployed whose period of statutory benefit under the National Insurance Acts had come to an end.

The world-wide depression which followed the American slump of 1929 caused unemployment in the U.K. to increase unprecedentedly, until in 1931 the number of registered unemployed men and women rose to over 2½ millions, or more than one in five of insured workers, about half of whom had been unemployed for more than a year; as examples, 55 p.c. of shipbuilding workers, 42 p.c. of cotton workers, 31 p.c. of coalminers, were out of work. An Act of 1927 had removed the limit of 26 weeks' benefit in a benefit year, and reduced the number of contributions necessary for uncovenanted, or transitional, benefit from 30 to eight in the previous two years. But the unemployment fund was running heavily into debt, and in 1930 an Act made transitional benefit a liability of the exchequer instead. Even so, owing to increasing unemployment, contributions to the fund decreased, and during 1930 unemployment expenditure (including transitional benefit of £16,725,000) was double the unemployment fund's income. Acts were therefore passed gradually raising the limit to which the fund might borrow from £60 million to £115 million.

Against this background an economy committee under Sir George May was set up by Ramsay MacDonald's Labour ministry

in 1931. It proposed cuts in govt. expenditure amounting to £96,103,000, of which £66,500,000 was to be the result of reducing unemployment benefits and increasing unemployment insurance contributions. The attempt by the govt. to implement these proposals led to a political crisis, and the formation by MacDonald, Aug. 25, of his first national govt. Snowden, chancellor of the exchequer, in Sept. introduced a budget imposing the cuts, and an order of Oct. reduced rates of unemployment benefit and restored the limit of 26 weeks' benefit in a benefit year, after which an unemployed person could apply for transitional benefit, but to receive it must pass before a public assistance authority a test of need applied not to the personal but to the family income. No rules guided the authorities making the tests, with the result that administration varied. Some authorities ignored savings up to £20, £50, £100, or £200; others insisted that all savings must be spent, and all property sold (as in the worst days of Poor Law administration).

How the Test Worked

Of 571,000 claimants between April 2 and Sept. 3, 1932, 180,000 were allowed less than the full rate, 107,000 were allowed nothing. Serious rioting occurred in Birkenhead on Sept. 17, 1932; Durham and Rotherham public assistance committees refused to administer the test, and other authorities did so under protest; hunger marchers from all parts of the country converged on London. In Nov. the Transitional Payments (Determination of Need) Act, commonly called the Means Test Act, decreed that in estimating needs, one-half a wound or disability pension, one-half workmen's compensation payments, any sum a claimant might be able to obtain by selling or mortgaging his house, and the first £25 of capital were to be disregarded. Each £25 of capital beyond the first up to £300 was to be treated as worth 1s. a week.

Full rates of unemployment benefit were restored in the 1934 budget, but the means test remained on the statute book until the passing of the National Insurance Act of 1946. Although the main part of this Act became operative only on July 1, 1948, a regulation made by the minister of national insurance brought into effect from Feb. 10, 1947, that section dealing with extended payments of unemployed benefit.

Irene Clephane

Mearns. Alternative name for the Scottish county of Kincardine. A district therein, a continuation of the valley of Strathmore, is known as the Howe or hollow of the Mearns. The name is supposed to be that of an early king. *See* Kincardineshire.

Measles. An acute contagious disease caused by a filter-passing virus. The disease is most frequent in childhood. The period of incubation, i.e. the interval from actual infection to the commencement of symptoms, may last from seven to twenty-one days; it is usually fourteen days. During incubation the patient is not contagious. Infection is a "droplet" infection, and it is communicated directly by the breath or nasal secretion.

The disease usually starts apparently as a feverish cold, with sneezing and running at the nose, coughing, and redness of the eyes. Headache, nausea, and vomiting may be the first symptoms. There may be a blotchy redness about the skin, and, generally on the fourth day, little red spots resembling flea bites appear on the face. The skin of the chest and abdomen exhibits a mottled, blotchy appearance. Improvement in the general symptoms usually begins about the fifth or sixth day. An early diagnostic symptom is the presence of whitish spots, surrounded by a red area, on the insides of the cheek. These are called Koplik's spots, after the observer who first described them. After the rash has faded, the superficial layer of the skin flakes off in fine scales (desquamation).

Common complications of measles are laryngitis, bronchitis, and broncho-pneumonia. More rarely, Bright's disease, endocarditis, inflammation of the middle ear, and other complications occur. These are due to secondary invading germs and usually respond to antibiotic drugs. Treatment for measles consists in keeping the patient in bed in a warm, well ventilated room, and in good nursing. Particular care should be taken during convalescence, as at this stage the complications of bronchitis and broncho-pneumonia arise.

Malignant or black measles is a severe form occasionally seen, in which bleeding into the mucous membranes, or into the skin, may occur.

Measles is responsible for a considerable mortality. The disease varies in severity with climate, in different generations, with the strength of the virus, and with the

resistance of the victim. Serum from a convalescent patient, if injected within a few days of contagion, may ward off the disease or allow only a mild attack to develop. Peoples who have no inbred resistance often suffer very severely if an epidemic occurs. One attack of true measles protects the patient for life.

Measure (Lat. *mensura*, measure). Word used in a number of senses. Instruments for determining the lengths of objects, vessels of known capacity, etc., are called measures, *e.g.* yard measure, tape measure, etc. A system of measurement is also called a measure, as board measure, long measure, etc. (See Surveying.)

In dancing, the word is used to indicate regulated movement, which corresponds to the time in which the accompanying music is performed. In poetry, the word is used to indicate the arrangement of the syllables, *e.g.* iambic measure. In arithmetic, greatest common measure is the greatest number which is contained without remainder in two or more numbers; in printing, the measure of a column or page is its width; and in geology, beds or strata are called measures, *e.g.* coral measures.

In fencing, the word is used for the limit of distance at which one opponent can reach the other by lunging. In architecture, a measure-and-a-half door is one which has moulding on one side only. See Weights and Measures.

Measure. Term in music. (1) A dance-tune, especially of a stately type. The term is much used by poets from the 16th century onwards, but no specific dance has been identified with it. (2) The space between two bar-lines. See Bar; Tonic Sol-fa.

Measure for Measure. Tragicomedy by Shakespeare. Angelo, an ascetic, made deputy for Vincentio, duke of Vienna, revises certain laws against immorality, and has Claudio condemned to death for an offence against them. He refuses the plea for mercy made by Isabella, Claudio's sister, save on the condition that she shall become his mistress. When he thinks she has consented, he orders Claudio to immediate execution. The duke returning, disguised as a friar, rescues Isabella by persuading Mariana, whom Angelo has jilted, to take Isabella's place at the assignation with him; saves Claudio by inducing the provost of the prison to postpone his execution; and having listened in his

real character of duke to the denunciation of Angelo by Isabella, takes her for his wife, and pardoning Angelo, compels him to marry Mariana. None of the characters is wholly likeable, and the play is interesting rather for its arguments on mercy and justice, and two speeches, that by the duke beginning "Be absolute for death," and Claudio's "Ay, but to die, and go we know not where." The scene of the play is laid in Vienna.

Written 1603-04, Measure for Measure was first published in the 1623 folio. It is a remodelling and refining by Shakespeare of a story in Giraldi Cinthio's Hecatommithi, 1565, which in turn inspired Whetstone's play of Promos and Cassandra, 1578, a prose version of which is in his Heptameron of Civil Discourses, 1582. The play includes 1,574 lines of blank verse, and 73 pentametric rhymes. Angelo has been played notably in modern times by Oscar Asche, Charles Laughton, and John Gielgud; Isabella by Lily Brayton and Flora Robson.

Meat (A.S. *mete*). Food obtained from many classes of animals. These include mammals, such as cattle, sheep, swine; birds; and in the broad sense also fish, amphibians, molluscs, and crustaceans. In general application meat is the flesh of animals used for food, including their edible organs and glands. The flesh of the carcass is the skeletal muscles, which are voluntary or striated, whereas in organs of the digestive tract, the type commonly found is smooth or non-striated. Heart muscle is of special form, striated and involuntary. As forming part of muscle, the fat, ligaments, tendons, blood vessels, and nerves can be termed meat.

Degree of fatness has profound influence on the value of meat. More fat means a higher calorific value, but less protein and water. The amount of bone normally expected in a beef carcass is 13-20 p.c.; in lamb, 15-18 p.c.; in pork, 14-16 p.c.; and in a side of bacon, 11-13 p.c. Representative analyses of the edible portion of carcasses give this table:

	Water p.c.	Protein p.c.	Fat p.c.	Calories per 100 gms.
Beef (lean)	65	16	18	226
" (average)	56	15	28	312
" (fat)	48	13	38	394
Lamb	55	13	31	331
Pork	47	12	40	408

Animal proteins contain the ten essential amino-acids and are

therefore of high biological value and termed first-class protein, though gelatine, from the collagen fibres, lacks at least one of the essential amino-acids (tryptophane). Fats, formerly valued chiefly as a source of energy, may act as carriers for vitamins. Meat is deficient in calcium, but a good source of phosphorus and iron, liver and kidney being particularly rich in both. Meat generally is unimportant as a source of vitamin A, though liver is an excellent source. The vitamin B complex, aneurin, nicotinic acid, and riboflavin, is found in meat, but the substances are affected by heat and lost by dissolving in water, especially aneurin. Meat has a high satiety value, for its fat content tends to retard digestion in the stomach. Beef and mutton pass through it in about 3 hours, pork in 3½ hours. The pre-1939 annual consumption of meat in Great Britain was 140 lb. a head.

Frank Gerrard, M.Inst.M.

Meat Extracts. Palatable extracts of meat are made by digesting chopped meat in boiling water, removing the fat, and concentrating the liquor. About 10 lb. of meat yields 1 lb. of extract which contains meat bases, amino-acids, gelatine, lactic acid, proteoses, peptones, and inorganic salts. Large quantities are obtained as a by-product in the corned beef industry. Meat extracts have a stimulant action on the gastric mucosa, improving appetite.

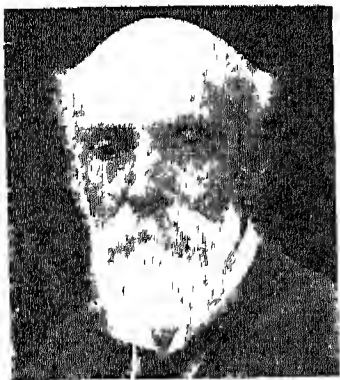
Meath. Co. of the Irish Republic, in Leinster prov. Area 903 sq. m., with a coastline of about 10 m. on the Irish Sea. Most of the county is level, but there are hills in the west. The chief rivers are the Boyne and its tributary, the Blackwater. The soil is fairly fertile. Oats and potatoes are grown; cattle, sheep, and pigs are reared. Meath is served by the state rly. Trim is the county town; other places are Navan, Kells, Oldeastle, and Athboy. Meath was the name of one of the kingdoms of Ireland, including Meath, Westmeath, Longford, and parts of other counties. The kings disappeared in the 12th

century, but not until the 16th century was the province, as it was called, divided into counties as at present. There are many ecclesiastical remains,

those at Duleek, Bective, and Clonard being of interest, while in

Meath are Tara and New Grange, with its burial mounds. There are R.C. and Protestant dioceses. The county of Meath returns three members to the dail. Pop. (1951) 66,343.

Meath, EARL OF. Irish title borne since 1627 by the family of Brabazon. In 1616 Sir Edward Brabazon, an Irish M.P., was made an Irish peer as Lord Ardee, and his son William, the 2nd baron, was made an earl. His descendants succeeded until the earldom came to John, 10th earl, who in 1831 was made a peer of the U.K. as Baron Chaworth. Reginald (1841-1929), who became 12th earl in 1887, was known as a promoter of

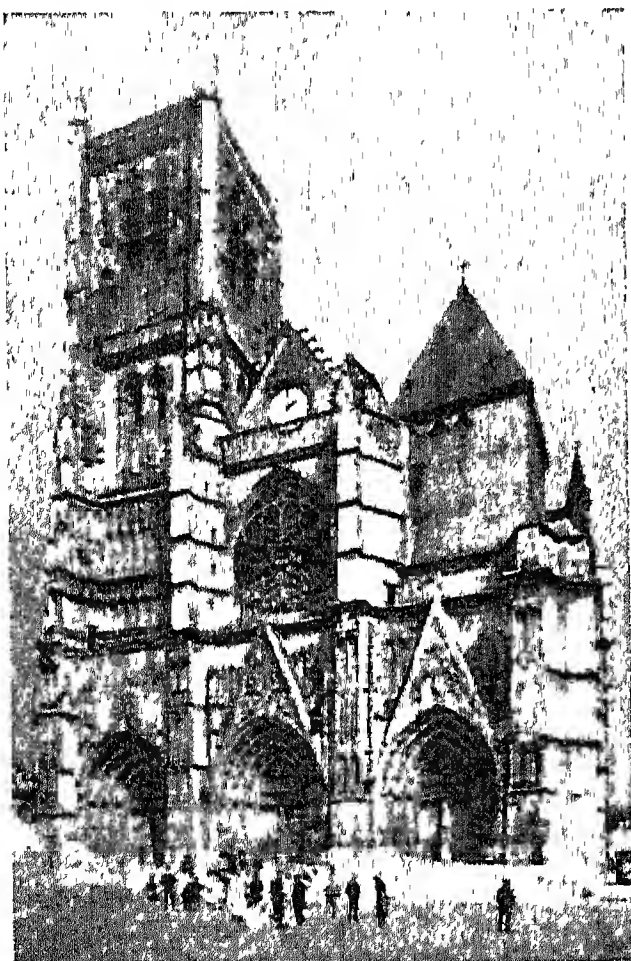


12th Earl of Meath,
Irish philanthropist

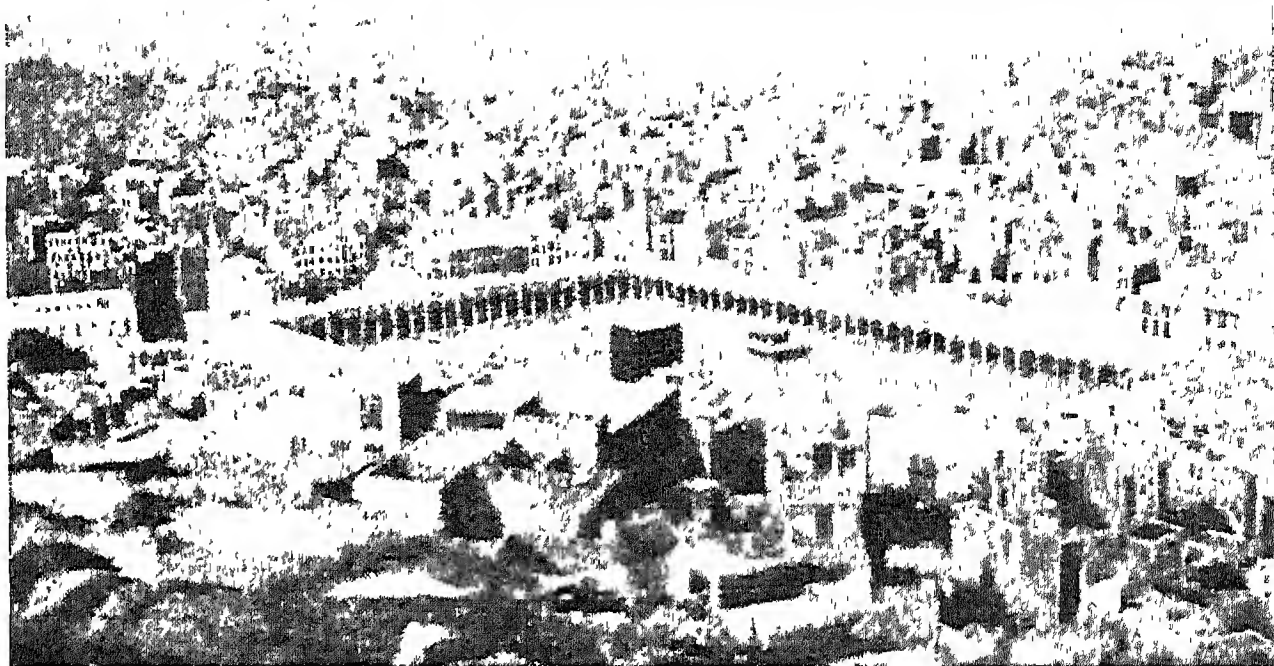
Empire Day and as a philanthropist. The 13th earl was his son, also Reginald (1869-1949), a brig.-gen. from 1918. The 14th earl, Anthony (b. 1910), was his son. Lord

Ardee is the title of an eldest son. The earl's estates are mainly in co. Wicklow.

Meaux. Town of N.E. France, in the dept. of Seine-et-Marne. It is situated at a hairpin bend of the Marne, 25 m. N.E. of Paris. The handsome cathedral of S. Étienne contains the remains of Bossuet, its most noted bishop (1681-1704). There is a large trade in grain and dairy produce, and sugar, flour, textiles, and steel are manufactured. Meaux was besieged by the



Meaux, France. West front of the cathedral, which was begun in the 12th century



Mecca, Arabia. Holy city of Islam, and since June, 1916, capital of the new kingdom of the Hejaz. The sacred Ka'aba is seen in the centre of the great mosque

English in 1520. It marks the nearest approach of the Germans to Paris in their opening offensive, Sept., 1914. It was held by the Germans in the Second Great War from June, 1940, until U.S. troops crossed the Marne here Aug. 28, in the rapid Allied advance of 1944. Pop. (1954) 16,767.

Mecca, MAKKAH, OR BAKKAH. City of Arabia, the ancient Macoraba, and now one of the capitals of Saudi Arabia. It lies about 45 m. E. of Jeddah, its port. As the birthplace of Mahomet, it is the chief Holy City of the Muslim world. It lies in a narrow valley, surrounded with hills, and as many of its houses are of stone it has a well-built appearance. Roads and the supply of water and electricity are being developed by Egyptians. The centre of interest is El Haram, the great mosque which has within it the sacred Ka'aba, surrounded by a vast court said to be capable of holding 30,000 worshippers. The pop. is about 200,000, but much more in time of pilgrimage.

At one time Mecca was an important emporium of trade, but latterly its main commercial enterprise has been supplying the pilgrims with souvenirs. Although all non-Muslims are strictly forbidden to enter the Holy City, it has been visited by several Christian observers, such as Sir R. Burton, who gave an account of it in his *Personal Narrative of a Pilgrimage to El Medinah and Meccah*, 1855.

In the First Great War Hussein Ibn Ali, the grand sherif, revolted against the Turks, and captured Mecca from them in 1916. In 1924 the city fell to the Wahabis as the result of the victory of the sultan of Nejd over King Hussein. In 1925 King Ali, who had acceded on his father Hussein's abdication,

surrendered to Ibn Saud, the Wahabi sultan, and in 1926, the latter proclaimed himself king in Mecca. See Arafat; Hejaz; Holy Carpet; Ka'aba; Mahomedanism; Mahomet.

Mechanical Engineers, INSTITUTION OF. A British scientific society. Founded in 1847 at Birmingham by George Stephenson, it removed to London in 1877, was registered under the Companies Act, 1878, and was incorporated by royal charter in 1930. It holds regular meetings. The address is 1, Birdcage Walk, St. James's Park, London, S.W.1.

Mechanics. That branch of science which treats of forces and motion. It is usually divided into two parts: statics, which deals with the action of forces on bodies at rest, and dynamics, which is concerned with the action of forces on bodies in motion. The whole science rests on the three laws of motion formulated by Newton: (a) a body will remain at rest or in a given state of motion until it is acted upon by an external force; (b) the acceleration of a body takes place in the direction of the force which produces it and is directly proportional to the magnitude of the force and inversely proportional to the mass of the body; (c) every action is accompanied by an equal and opposite reaction. These laws cannot be proved by experiment, but every conclusion based on them has been found to be in accord with experience when they are applied to any finite material system.

The first law defines a property of matter known as its inertia, which is proportional to its mass. Mass is the quantity of matter in a body and the standard units of mass are the pound and the kilogramme, which are certain pieces

of metal preserved in London and in Paris respectively. The second law defines force in terms of its ability to overcome inertia. It is expressed mathematically by the relationship $f=ma$, where f is the force, m the mass on which it acts and a the rate of change in the velocity of the body, that is, the acceleration produced. A unit of force can then be defined as the force required to give unit mass unit acceleration.

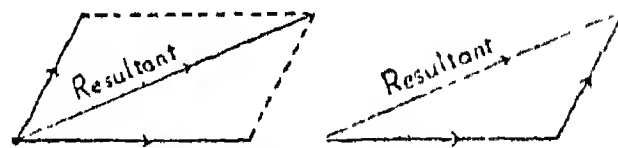
In the c.g.s. system the unit of force is the dyne, which gives a mass of 1 gram an acceleration of 1 cm. per sec. per sec. A mass of one gram dropped near the earth's surface falls with an acceleration of about 981 cm. per sec. per sec. It will therefore take 981 dynes to equal one gram-weight. (Here gram-weight is a unit of force, equal to the force with which the earth attracts a mass of one gram. Since the strength of the earth's gravitational field varies slightly in different parts of the world, units like the gram-weight and lb.-wt. also vary. Gram and dyne, however, are the same everywhere.) The dyne is a very small unit. The unit of force in the m.k.s. (practical) system is the newton, which gives a kilogram an acceleration of 1 metre per sec. per sec., and hence is equal to 10^5 dynes.

In the f.p.s. system the unit of force is the poundal, giving an acceleration of one ft. per sec. per sec. to a mass of 1 lb. In engineering and aerodynamics, however, the convention is now to make the unit of force the lb.-wt. This gives an acceleration of 32.1725 ft. per sec. per sec. (standard value for the acceleration due to gravity) to a mass of 1 lb., or of 1 ft. per sec. per sec. to a mass of 32.1725 lb. (i.e. 1 slug).

The momentum of a body is the product of its mass and its velocity, and can be thought of as a measure of its impetus. Force is then found to be equal to rate of change of momentum. Work or energy (*q.v.*) is measured as a product of the force and the distance through which it acts. Units are the erg or dyne-centimetre; the joule, equal to 10^7 erg; the foot-poundal, and the ft.-lb. Power, which is the rate of doing work, is measured in watts (i.e. joules per second), and in horsepower, one horsepower being equal to 33,000 ft.-lb. per minute, or 746 watts.

Compounding of Forces. Forces are vector quantities: they have direction as well as magnitude. When they are represented by lines, the direction of the line gives

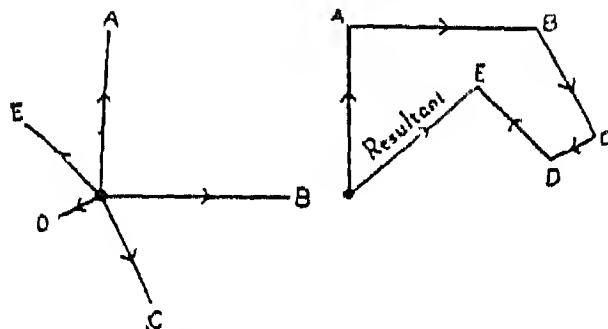
the direction of the force; the length gives its magnitude. If two forces acting at a point are represented in this way and two further lines are drawn to complete a parallelogram, then the sum or resultant of the two forces is represented by the diagonal of the parallelogram. This can then be similarly compounded with a third force, whether in the same or a different plane, and the resultant of any number of forces found. Alternatively, two forces can be represented by two lines drawn in sequence (instead of both from the same point); in which case the



Mechanics. Fig. 1

resultant is represented by the third side of the triangle. An extension of this method to three or more forces gives the resultant as the line joining the first point to the last without the necessity of intermediate compounding. These graphic methods are a practical substitute for vectorial algebra. They are equally effective for compounding velocities.

If two forces, together with a third equal but opposite to their resultant, act at a point, the three are said to be in equilibrium. Any three (or more) forces in equilibrium at a point can be represented by the sides of a triangle (or polygon) taken in order. This

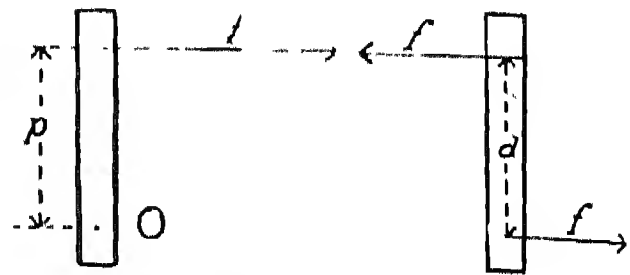


Mechanics. Fig. 2

principle of forces in equilibrium is important in statics, and has many practical applications in working out conditions of stability in buildings, ships, etc.

Rotational Forces. The moment of a force f about a point O is a measure of its tendency to produce rotation about an axis passing through O . It is equal to the magnitude of the force multiplied by the perpendicular distance from the axis to the line of action of the force. Two equal and parallel forces, acting in opposite directions, produce a couple or pure turning moment, without a resultant force tending to cause translational motion. The moment of

a couple or torque is the product of one of the forces and the perpendicular distance between their



Mechanics. Fig. 3

lines of action. Moments of inertia for various geometrical figures under rotational forces are given in the article on Moment.

Machines. These are contrivances which enable a force to work more conveniently. The simplest are the levers (*q.v.*), divided into three orders according to the relative positions of power or effort, load or weight, and fulcrum. In each order the energy applied will be equal to the work done; but where a small force raises a larger weight it will have to act through a greater distance. This also applies to arrangements of pulleys (*q.v.*) by which a mechanical advantage may be obtained; to the inclined plane (*q.v.*) and its modification the screw; and to the hydraulic intensifier (*see* Hydraulics).

Mechanics' Institute. Institution designed originally for the education and improvement of working men. The first was established at Glasgow in 1823 by Dr. George Birkbeck. The London Mechanics' Institution founded in 1823, renamed the Birkbeck Institute, became later Birkbeck College (*q.v.*) a centre of evening university instruction.

Mechanics' institutes, often under the management of a committee of working men, were established in many towns to provide usually a reading-room, a library, and a room for debates and lectures. With the growth of free libraries and opportunities for adult education, most of them disappeared.

Mechitarists. Society of Armenian Christians. It was founded in 1701 by Meehitar da Pietro (1676-1749), who became an Armenian priest in 1699, his object being to establish an organization for educating his fellow-countrymen and improving their religious condition. In 1715 he secured the island of San Lazzaro between the Lido and Venice, and founded there the Armenian convent. The Mechitarists have translated and published in Armenian many of the chief productions of European



1. Naval General Service, 1793-1840. 2. Military General Service, 1793-1814. 3. Waterloo, 1815. 4. Kabul, also Kandahar and Ghazni, 1842. 5. Sind, 1842-43. 6. Gwalior star, 1843. 7. China, 1842, 1857-60, 1900. 8. Sutlej, 1845-46. 9. New Zealand, 1845-66. 10. Punjab,

1848-49. 11. India General Service, 1854-95. 12. South Africa, 1834-35, 1846-47, 1850-53, 1877-79. 13. Crimea, 1854-56 (British). 14. Crimea (Turkish issue to British). 15. Baltic, 1854-55. 16. Indian Mutiny, 1857-58. 17. Canada Gen. Serv. 1866-70. 18. Abyssinia 1867-63.

MEDALS (1). BRITISH NAVAL AND MILITARY CAMPAIGN MEDALS WITH THEIR RIBBONS

The majority of the actual medals measure $1\frac{1}{2}$ inches in diameter



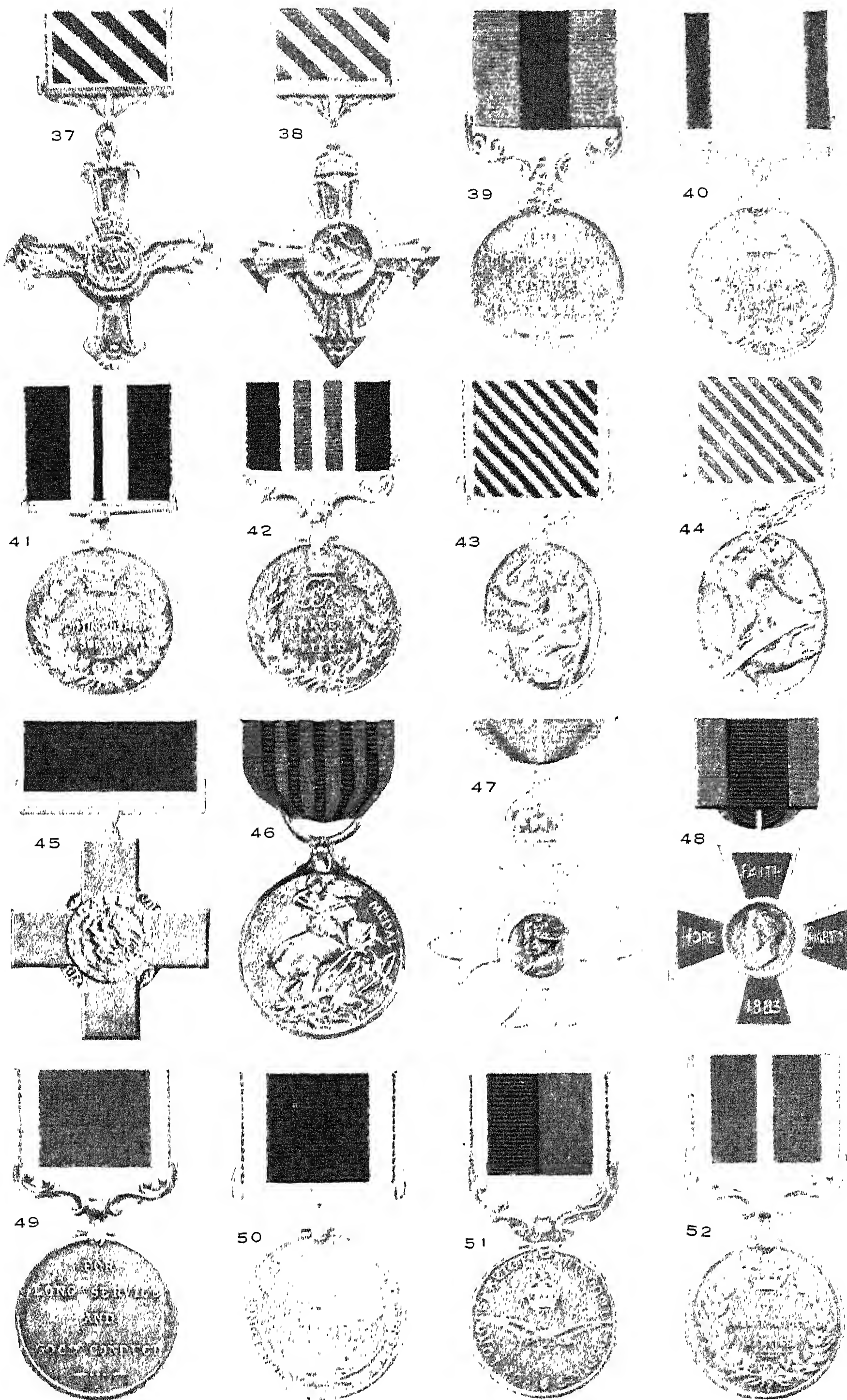
19. Ashanti and E. and W. Africa 1873-74, 1887-1900. 20. Afghanistan, 1878-80. 21. Kabul to Kandahar star, 1880. 22. Cape Gen. Serv., 1880-81, 1896-97. 23. Egypt, 1882-89. 24. Khedive's star, 1885. 25. N.W. Canada, 1885. 26. Brit. S.A. Co.'s medal for Matabeleland, 1893; Rhodesia, 1896; Mashonaland, 1897. 27. Ashanti star, 1896. 28. India

Gen. Serv., 1895-1902. 29. Cent Africa, 1891-95. 30. Sudan, 1896-97. 31. Khedive's medal, 1897-99. 32. Ribbon of E. and Cent. Africa medal, 1897-99, reverse, except for inscription, as 36. 33. Ribbon of Queen's S.A. medal, 1899-1902; reverse as 34. 34. King's S.A. medal, 1901-02. 35. Ashanti, 1901. 36. Africa Gen. Serv., 1900-14.

MEDALS (2). BRITISH NAVAL AND MILITARY CAMPAIGN MEDALS WITH THEIR RIBBONS

The majority of the actual medals measure 1½ inches in diameter

[See over

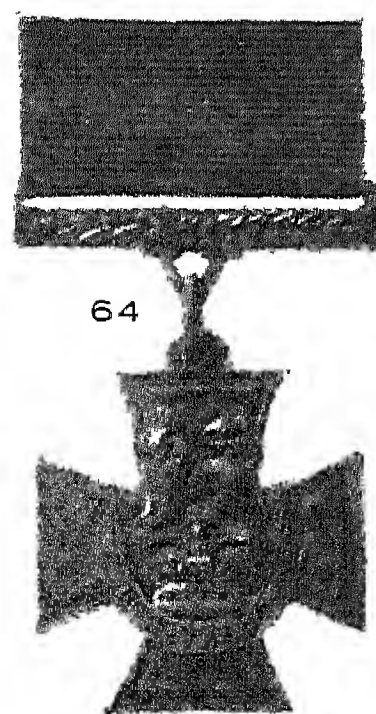
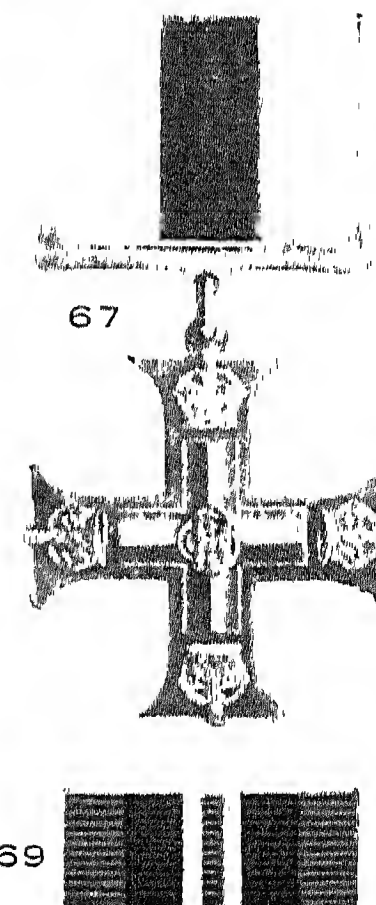
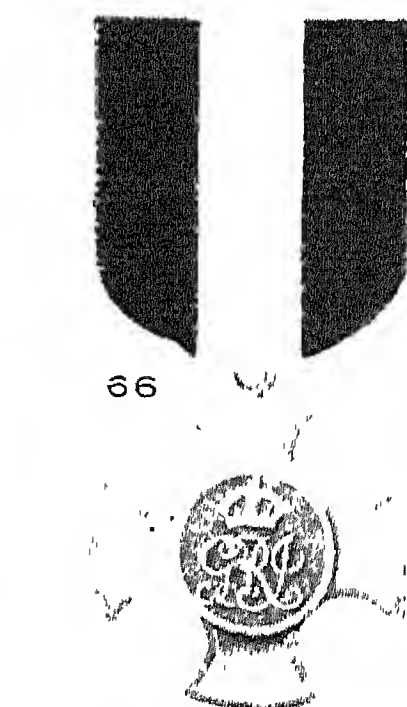
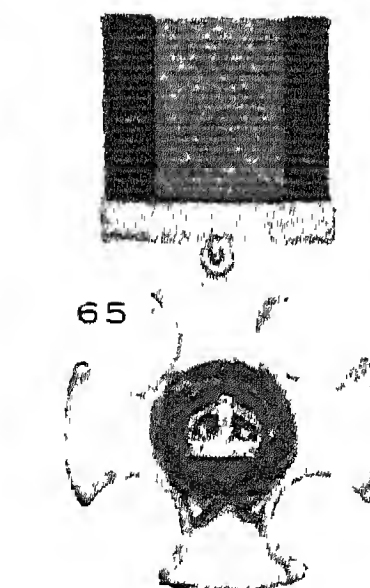
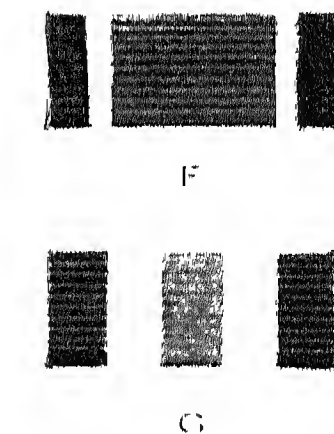
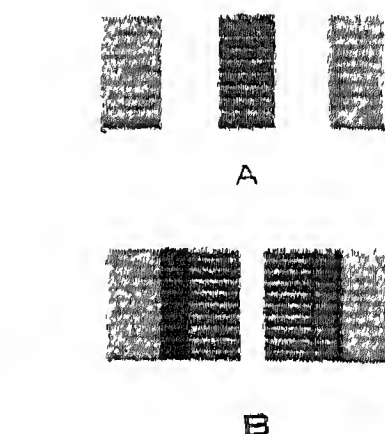
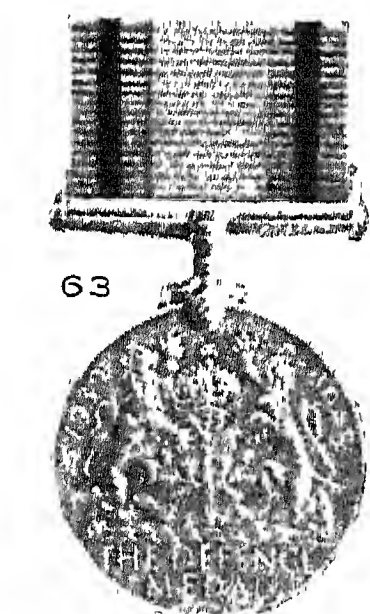
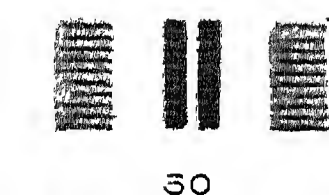
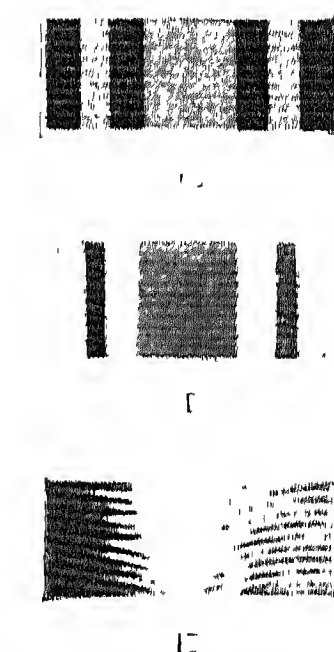
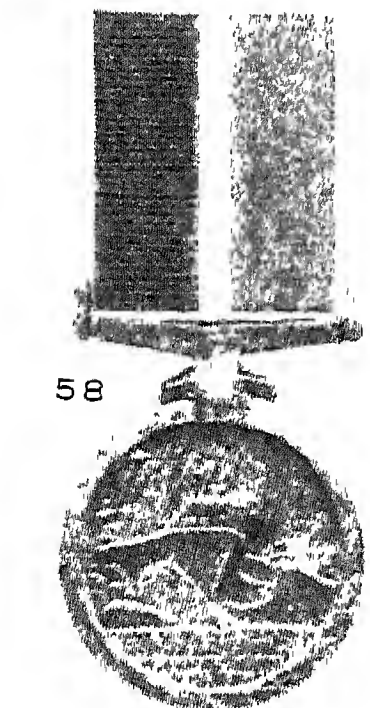
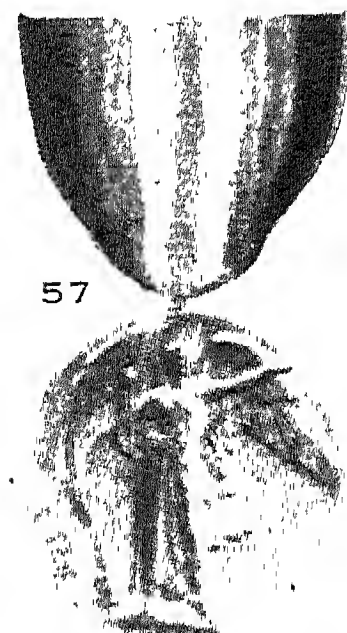
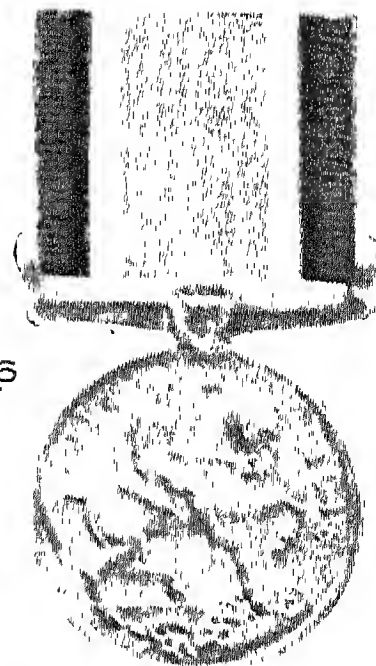
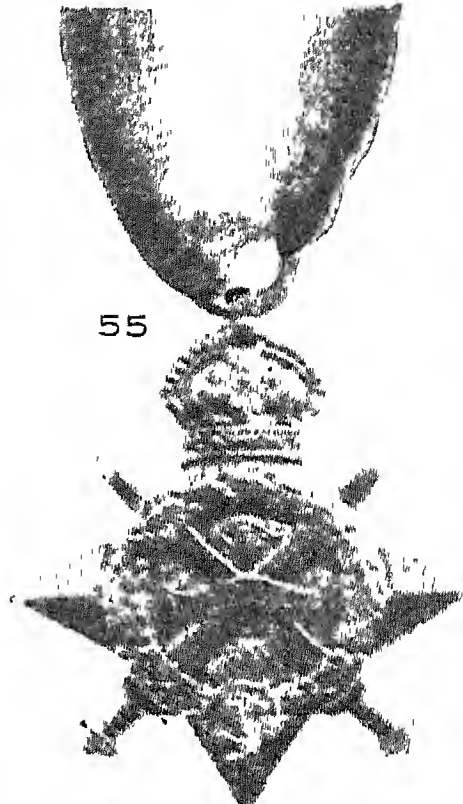
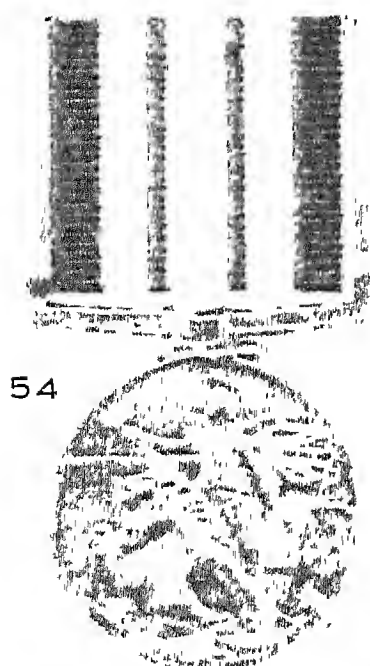
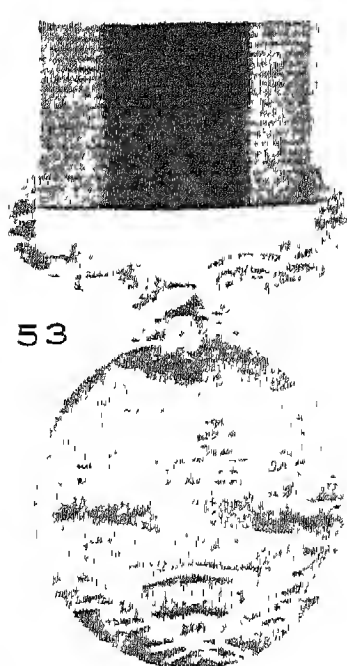


37. Distinguished Flying Cross (Operational Flying).
 38. Air Force Cross (Non-Operational Flying). 39.
 Distinguished Conduct Medal (Army). 40. Con-
 spicuous Gallantry Medal (Navy). 41. Distinguished
 Service Medal (Navy). 42. Military Medal (Army).
 43. Distinguished Flying Medal (Operational Fly-
 ing). 44. Air Force Medal (Non-operational Flying).
 45. George Cross (Civil and Military). 46. George

Medal (Civil and Military). 47. Order of the British
 Empire (Military division). 48. Royal Red Cross
 (Civil and Military nursing services). 49. Long
 Service and Good Conduct Medal (Army). 50. Long
 Service and Good Conduct Medal (Navy). 51. Long
 Service and Good Conduct Medal (R.A.F.).
 52. Meritorious Service Medal (Army and Royal
 Marines non-commissioned officers).

MEDALS (3): BRITISH GALLANTRY AWARDS AND SERVICE MEDALS WITH THEIR RIBBONS

The majority of the actual medals measure 1½ inches in diameter



53. India General Service, 1908-1919. 54. Naval General Service Medal. 55. 1914-1915 Star. 56. British War Medal, 1914-1918. 57. Victory Medal, 1914-1919. 58. Mercantile Marine War Medal, 1914-1918. 59. 1939-1945 Star. Similar Second Great War stars have these distinctive ribbons: A. Italy Star. B. Pacific Star. C. Burma Star. D. Africa Star. E. Atlantic Star. F. Aircrew Europe Star. G. France and Germany Star.

60. Ribbon of King's Medal for Courage in the Cause of Freedom, 1940-1945. 61. Ribbon of the India Service Medal, 1939-1945. 62. Ribbon of King's Medal for Service in the Cause of Freedom, 1940-1945. 63. Defence Medal. 64. Victoria Cross. 65. Distinguished Service Order. 66. Distinguished Service Cross (Navy). 67. Military Cross. 68. Ribbon of Canada Medal, 1939-1945. 69. Ribbon of the British War Medal, 1939-1945.

MEDALS (4): BRITISH CAMPAIGN MEDALS, GALLANTRY AWARDS, AND RIBBONS

The majority of the actual medals measure $1\frac{1}{2}$ inches in diameter

literature. They have also an academy at Vienna which was founded in 1810.

Mechlin. An alternative name for the Belgian town of Malines (Flem. Mechelen). The word often designates a variety of lace which was originally made there. See Lace; Malines.

Mecklenburg. Former name of a part of Germany lying along the Baltic coast. An agricultural area noted for its cattle, and with shipbuilding in its ports of Wismar and Rostock, it was split into two grand duchies until 1918, and two free states under the Weimar republic, called after their capitals Mecklenburg-Schwerin and Mecklenburg-Strelitz.

Originally inhabited by Slavonic tribes. Mecklenburg was conquered by Henry the Lion in the 12th century. The Obotrite rulers were baptized and continued in succession until the 1918 revolution, though parts of their lands, with Wismar, were annexed by Sweden in 1648 and not recovered until 1803. Both duchies had until early in the 20th century a reactionary constitution. In 1918 they adopted republican forms. In 1934 the Nazis combined them, with Lübeck, into one state.

Mecklenburg, which lay in the Russian zone of occupation, was in 1945 constituted an E. German *Land*, to which in 1946 was added the part of Pomerania lying W. of the Oder, giving Mecklenburg an area of 8,860 sq. m., pop. (1950) 2,139,640. The *Länder* were abolished in E. Germany in 1952, but roughly what had been the enlarged *Land* of Mecklenburg was divided into the regions of Rostock (area 2,720 sq. m.; pop., 1955, 845,600), Schwerin (3,320 sq. m.; pop. 651,000), and Neubrandenburg (4,240 sq. m.; pop. 687,000).

Mecklenburg Bay. Wide bay of the Baltic Sea in N. Germany. It is nearly 50 m. wide between Fehmarn Island and Darss, and 30 m. long. See Lübeck Bay.

Mecklenburgh Square. London square. It lies to the W. of Gray's Inn Road, W.C.1, and E. of the grounds of the old Foundling Hospital, on part of the estate of which it was built early in the 19th century. It was named in honour of Princess Charlotte of Mecklenburg-Strelitz, consort of George III. London House, a residential centre for men students from the overseas countries of the British Commonwealth, occupies the S. side of the square; started in 1937, it was still incom-

plete in 1958. On the N. side of the square is William Goodenough House, a residential collegiate building for women and married students, also from overseas; it was opened in 1957 and paid for by a fund started in 1950 by the lord mayor of London in thanksgiving for food parcels sent during the Second Great War from the U.S.A. and the dominions.

Médaille Militaire. French decoration. It was founded in 1852 to reward French private soldiers and non-commissioned officers for bravery in the field. During both Great Wars several Allied soldiers were recipients, and in 1947 the medal was awarded to Winston Churchill, Marshal Stalin, and posthumously F.D. Roosevelt.



Médaille Militaire
Spink & Sons

Medal (Fr. *médaille*, from Ital. *medaglia*, a coin, from Low Lat. *medalia*, a small coin, corrupted from Lat. *metallum*, metal). Piece of metal struck to preserve the memory of some eminent person, to commemorate some illustrious action or event, or as an award for gallantry or merit. Medals form a branch of the art of numismatics and, like coins, may be cast or struck from gold, silver, or alloys of base metals.

The Greeks and the Romans struck large medals as medallions in honour of certain events or personages. One such was that awarded to victors at the Olympic games. Other Greek medals commemorated military successes, or were issued in honour of poets, artists, and philosophers. Roman medals usually carried on the reverse the reigning emperor's head, and on the obverse representations of heroes, divinities, or places associated with the event or object commemorated.

After the fall of the Roman empire, the art of the medallist rapidly declined and few medals were struck apart from miraculous and scapular medals distributed to the faithful by the Holy See. With the Renaissance, the design and production of medals revived. The greatest exponent of medallic art was the Veronese painter, Vittore Pisano (1380-1456). His medals, generally signed *Opus Pisani Pictoris*, founded a tradi-

tion of vivid sculpture and simplicity of treatment that continued until the end of the 16th century. Cellini, in Italy, Dürer in Germany, Pilon and Dupré in France also designed outstanding medals.

Most modern medals are struck to commemorate war service or to award gallantry in action: they are a development of the badges suspended from the chains of knighthood. The first recognizable war medal was a papal medal specially struck in 1480 and presented to John Kendall, Prior of the knights of S. John, for his relief of Rhodes.

Queen Elizabeth I was the first sovereign to bestow a medal for particular military service to the crown. This was the Ark in Flood medal (so called from its design) to commemorate the victory over the Armada in 1588, and granted to certain captains in the makeshift fleet that defeated the Spanish. A modified version was issued by James I to successful admirals. Under royal warrant dated May 18, 1643, Charles I authorised the first army medal. This was a silver badge bearing the royal effigy and cypher, and was awarded to every man who had done faithful service in the forlorn hope, i.e. the tactical advance guard of those days. In 1649 the Commonwealth parliament struck gold medals for the navy, and a year later authorised the medal of parliament for the army. These medals were worn round the neck suspended from a gold chain, and their bestowal was restricted to officers in command. The first English campaign medal, a small silver badge pinned to the coat, was issued by Cromwell to all officers and men who took part in the battle of Dunbar, Sept. 3, 1650. Thereafter, however, the issue of medals was again confined to commanding officers. The one awarded for the suppression of the Monmouth rebellion was bestowed upon Bishop Mew, who had commanded the royal artillery at Sedgemoor. An unofficial medal was given by the Cumberland society to certain officers who had taken part in the battle of Culloden in 1745. The only British medal issued for the American War of Independence was that specially struck by parliament to reward Captain Ewing's distinguished service at Bunker Hill.

In 1795, gold medals were awarded to the admirals and captains who had commanded in Lord Howe's victory over the

French fleet on June 1, 1794. Admiralty orders laid down that admirals were to wear them suspended from a blue and white ribbon round the neck, while captains were to attach them to the third buttonhole of their coats with a similar ribbon. This was the first official mention of medal ribbon.

Because there was no official medal for the lower deck at the battle of the Nile Nelson's prize agent, Alexander Davison, had medals struck at his own expense and distributed to all ratings who had taken part in the action. Similar private distribution of commemorative medals was made by the Soho mint after Trafalgar. The East India Co. awarded the Deccan medal to all European and native troops participating in the 1778-84 campaigns.

Introduction of the Clasp

During the early campaigns of the Peninsular War field officers received a gold medal for every battle in which they took part. But owing to expense clasps (the first instance of medal clasps) were introduced: when an officer had earned a medal and four clasps, he surrendered the decoration and received a gold cross in its place. Clasps were then added to the ribbon of the cross for additional battles. The first campaign medal similar in design and metal to be issued to all ranks was the Waterloo medal, awarded in 1816. The China medal (1840-42) was also given to all ranks as was the East India Co. medal for Jellalabad (1842).

Medals for rank and file who served in the Peninsular War were not issued until 1847, 34 years after the date of the last battle, and then only to surviving claimants. This accounts for the fact that the profile of Queen Victoria appears on medals bearing bars for Maida, Corunna, etc. In 1848 a silver medal was struck by the govt. for naval ratings who had taken part in the sea operations of the Napoleonic wars. These two medals eventually became the General Service medal for army and for navy.

Since the issue of the China medal in 1842, every British naval and military operation of importance has been officially recognized by the grant to all ranks participating of a medal, or of a clasp to a previous medal. Of the medals issued for service in the First Great War the Victory medal was unique in that its design and ribbon were common

to all the Allied navies and armies. The largest number of campaign medals issued for any one war were those of the Second Great War; one of these, the Defence medal, was the most widely distributed of any war medal, and was unique in being awarded to civilians as well as military personnel. (*See Campaign Stars.*)

Until the institution of the Meritorious Service medal in 1845 there was no gallantry award for non-commissioned ranks in the navy or the army; gallantry and distinguished service in officers was recognized by making them knights or companions of one of the orders, usually the Bath. In 1854 the Distinguished Conduct medal was instituted for all ranks; this was followed by the Victoria Cross in 1856 and the Conspicuous Gallantry medal in 1874.

Other groups of medals worthy of notice are navy, army, and R.A.F. long service and good conduct medals; also ceremonial medals, such as those issued for coronations and jubilees; official civil awards, notably the Albert and Edward medals; and unofficial civil medals, such as those presented by the Royal Humane Society, Lloyd's, and the Royal National Lifeboat Institution.

Design of Ribbons

Medals and decorations are worn suspended from a ribbon, the colours of which generally symbolise the event or campaign for which the medal was issued. So much ingenuity is displayed in evolving colour combinations that among the ribbons of the 3,500 distinct British and foreign medals and decorations in less than half-a-dozen instances are the colours duplicated, *e.g.* the British jubilee ribbon of 1935 is the same as that of the Massachusetts Civil medal, and the Arkansas State medal has its ribbon duplicated in a Yugoslav order.

Amongst the most appropriately coloured British medal ribbons are: the yellow, red, and black of the Omdurman medal, symbolising the red-coated British troops in the desert repelling the black followers of the Mahdi; the white and blue ribbon of the Egyptian wars, referring to the country lying between the White and Blue Niles; and the green and red separated by a white stripe of the Mercantile Marine medal (1914-1918), representing the port, starboard, and masthead lights of a ship.

One of the most successfully symbolic ribbons of the Second

Great War is that of the Defence medal: flame, for air attack; green for "England's green and pleasant land"; two black stripes for the black-out. The red, white, and green of the Italy Star are the national colours of Italy, the red, white, and blue of the France and Germany Star are the national colours of France, Italy and France (chiefly) being where the campaigns were fought. In July, 1951, the United Nations issued its first campaign medal; of bronze and having a blue and white ribbon, it was granted for service in the Korean conflict. The British Korea medal, which has a blue and yellow ribbon, was also authorised in July 1951. *See separate entries on the principal medals.*

David Le Roi

Medea. In Greek mythology, daughter of Aeëtes, king of Colchis. When Jason came to Colchis in search of the Golden Fleece, Medea fell in love with him, and by magic



Medea. A 16th century copy of a 5th century B.C. Greek relief

arts assisted him to obtain possession of the prize. She returned with Jason to Iolcus as his wife. There it was found that Pelias the king had murdered his half brother Aeson, Jason's father. In revenge, Medea persuaded the daughters of Pelias to cut their father in pieces and boil him, deceiving them into the belief that he would thereby become young again. Expelled from Iolcus for this deed, Medea and Jason next went to Corinth, where Jason deserted Medea for Creusa, daughter of Creon, the king. Medea avenged herself on Creusa by sending her a poisoned garment, which killed her, and by murdering the two children she herself had borne to Jason. Medea is said then to have fled to Athens, and to have there married king Aegeus. A plot by her to poison Theseus

having been discovered, she escaped from Athens to Asia. The tragic life of Medea is the subject of fine plays by Euripides and Corneille.

Médecin Malgré Lui, *Le* (the doctor in spite of himself). Farceical comedy in three acts by Molière, produced at the Palais-Royal, Paris, Aug. 6, 1666. Sganarelle, a character acted by the author, having been taunted into thrashing his wife, she retaliates by proclaiming that he is an eccentric but learned physician who will not admit his learning unless he is soundly beaten. The play was founded on an old fabliau.

Medellín. Second largest and chief industrial city of Colombia, and capital of the dept. of Antioquia. It is built at an alt. of 5,046 ft. and enjoys a summer-like climate throughout the year. It is 42 m. S.E. of Antioquia and 125 m. N.W. of Bogotá, and is connected by rly. with Puerto Berrio on the Magdalena. The seat of an archbishopric, it was founded in 1675, and has a university (instituted 1822), schools of law, medicine, mining, engineering, etc., a mint, libraries, and tennis, football, and polo grounds. Seventeenth-century buildings include the old cathedral and the churches of S. Benito, La Veraeruz, and San José.

The centre of an area producing gold and silver and coffee, it has many textile mills, responsible for the production of 80 p.c. of Colombia's textiles; there are also factories making cement, glass, chocolate, and beverages; steel and tile works; and tobacco factories. Pop. (1951) 358,189.

Medes (Assyr. Amadâ). Aryan people closely associated in language and descent with the Persians. When the Assyrians invaded their country in the 9th century B.C. they were settled in the Kurdish Mts. east of Lake Urmia. Later they moved southwards to the region of Ecbatana (modern Hamadan) which became the royal residence. They are mentioned several times in the O.T., first in Gen. 10 as the Madai, descendants of Japheth. At first overlords, then vassals of Persia, they were privileged subjects of the Achaemenid kings; Medes and Persians formed the royal bodyguard, and are so depicted at Persepolis. "The law of the Medes and Persians" (Dan. 6, vv. 8, 12, 15) became a synonym for the unalterable. See also Media.

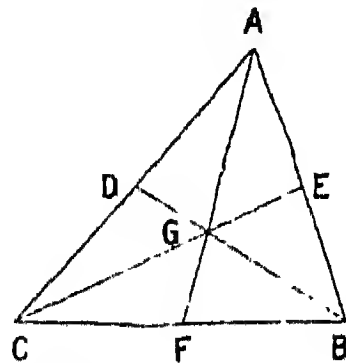
Medford. City of Massachusetts, U.S.A. In Middlesex co. and virtually a N.W. suburb of

Boston, it is linked by rly. with that city, and stands on the Mystic river. Seventeenth-century buildings include Cradock, Wellington, and Royall Houses. Medford was founded in 1630, though it did not become a city until 1892. Two schools of Tufts University are here. Medford rum and Medford-built sailing ships were once famous, but both these industries declined; machinery and chemicals are made. Pop. (1950) 66,113.

Another Medford is in Oregon, 20 m. from the Californian border. Pop. (1954) 19,050.

Media. Ancient country of W. Asia, lying S. and S.W. of the Caspian Sea, and wholly contained in the territory of the modern state of Persia. Part of the great Iranian tableland, and for the most part 3,000 ft.—5,000 ft. above sea level, it enjoyed a temperate climate, with cold winters and a fertile soil. The capital was Ecbatana (modern Hamadan). Shortly after 700 B.C. the Medes threw off the Assyrian yoke, and became a great nation under their kings Phraortes and his son Cyaxares. The successive steps in the extension of the Median empire are obscure, but in 612 Cyaxares took Nineveh and overthrew the Assyrians, dividing the Assyrian empire with his ally Nabopolassar of Babylon.

In 549 Cyrus of Persia, who acknowledged the sovereignty of Astyages, son of Cyaxares, rebelled, and his successors ruled a combined empire of Medes and Persians. With the overthrow of the Persians by Alexander the Great after the battle of Arbela in 331, Media became part of Alexander's empire. After his death in 323, it formed part of the kingdom of the Seleucidae, until in 147 it was conquered by the Parthians and was finally merged in Persia under the Sassanids in the 3rd cent. A.D. Consult The Five Great Monarchies of the Ancient World, G. Rawlinson, 1862-67; A History of Early Iran, G. G. Cameron, 1939; Iran in the Ancient East, E. Herzfeld, 1941.



Median. Figure showing medians, A F, B D, C E, of a triangle, A C B. The medians meet at the centroid or centre of gravity, G of the triangle

Median. In geometry, each of the three lines drawn from the middle points of the sides of a triangle to the vertices. Such lines meet in a point which

is geometrically the centroid or commonly the centre of gravity of the triangle.

Median Nerve. One of the main nerves of the arm. It rises from the brachial plexus on the outer side of the armpit, runs at first close to the axillary artery, then inclines outwards, and passes down the middle of the forearm to the palm. It gives off branches, which supply all the superficial flexors of the forearm except the flexor carpi ulnaris; while a branch, the anterior interosseus, given off just below the elbow joint, supplies the deep muscles of the forearm. In the hand, the nerve supplies various muscles of the thumb and fingers, and is also a nerve of sensation to the thumb, the index and middle fingers, and the outer side of the ring finger.

Mediant. Third note of the musical scale, so called from its position midway between the other two principal notes, the tonic and the dominant. The mediant has the important function of determining the mode as major or minor, thus:



Mediatisation (late Lat. *mediatus*, middle). Term derived from feudal usages. In feudal times land was held immediately, i.e. direct from the king, or mediately, i.e. from some other lord, who in his turn was the king's vassal. In 1803, during the changes occasioned by the wars that followed the French Revolution, certain princes ceased to be the emperor's vassals direct, but were placed under rulers of lesser rank. To this process, which amounted in practice to depriving these princes of their sovereign rights, for the emperor's authority over them had been nominal, the name mediatisation was given. It was carried further in 1806 in order to provide for Napoleon's territorial changes, and these rights were never restored although the mediatised princes of Germany formed for some time a distinct class, retaining equality of birth with the reigning princes.

Medical Association, BRITISH. Details of this organization of medical men will be found under British Medical Association.

Medical Officer of Health. In Great Britain an official appointed by all county, borough, and district councils. He(he) must be a qualified medical practitioner and must have additional qualifications

in public health. His duties are prescribed by various Acts of Parliament, by the ministry of Health, or by the council employing him. He receives notices of all births, and is concerned with the sale of food and drugs, housing, infectious diseases, sanitation, and with public health generally.

Medical Practitioner. One who practises medicine. In the British Isles the term is restricted to a practitioner registered under the Medical Act in force at the appropriate time. Provisional registration may be obtained by holding a primary qualification—*e.g.* a degree or licentiate—and passing an examination and thereafter full registration may be obtained after satisfactory service as a resident in a hospital or institution. Practitioners from other countries may obtain registration on fulfilling certain requirements.

While anyone may practise medicine without being registered, it is a serious offence for a

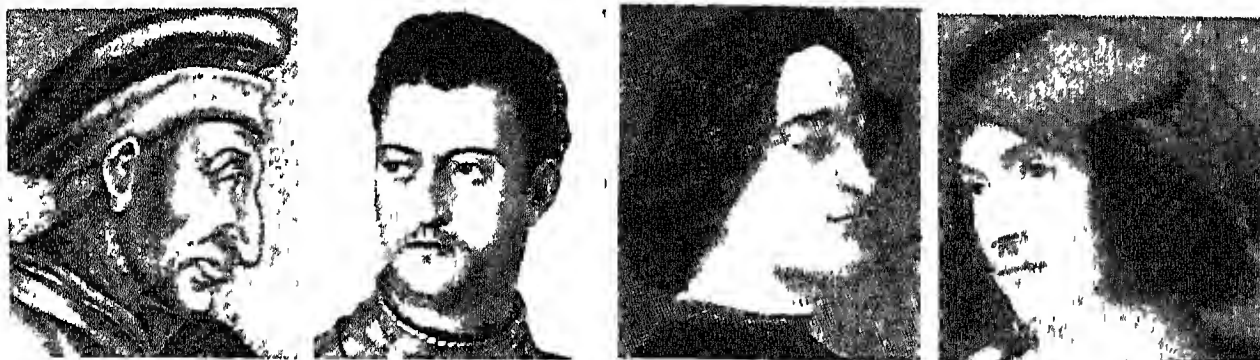
administrative direction of a committee of the privy council and applies money voted by parliament or received from private sources for medical research. Its many establishments include the National Institute for Medical Research, opened 1950. Its reports are pub. by H.M.S.O. Its h.q. is 38, Old Queen St., London, S.W.1.

Medici. Ruling family in Florence. It was prominent in the Florentine republic from the 13th century, and amassed wealth by trade, especially banking. Giovanni, father of Cosimo the elder, was the real founder of the greatness of the family, in which the headship of the state became hereditary. His great-grandson, Lorenzo, was succeeded by his son Piero II, who made cowardly concessions to the French, and was expelled with the rest of the family by the Florentines in 1494, but in 1512 they were recalled. Piero's brother Giuliano II was restored

at Florence. Cosimo after his father's death in 1429 occupied a leading position, but in 1433 was banished. Recalled the next year by the citizens, he expelled his enemies and, while remaining nominally a private citizen, was the virtual despot of Florence for the rest of his life. A generous patron of art and learning, he collected many ancient MSS. He also did much to increase the trade of Florence. He died Aug. 1, 1464, and was described on his tomb as the father of his country.

Medici, COSIMO DE' (1519-74). Grand duke of Tuscany. The son of the condottiere Giovanni de' Medici, he belonged to a junior branch of the family, and on the murder of Alessandro de' Medici, duke of Florence, in 1537, he was proposed as a candidate by the historian Guicciardini and acknowledged as duke by the emperor Charles V. Maintaining his rule by a system of espionage and secret murder, he proved an able ruler, organizing the Tuscan state as a political unit, and establishing a strong army. In 1555 he took Siena, which two years later was formally ceded to him. In 1569 Cosimo was raised by Pope Pius V to the rank of grand duke. He died April 21, 1574.

Medici, LORENZO DE' (1449-92). Ruler of Florence. The elder son of Piero de' Medici, he was born Jan. 1, 1449, and in 1469, on his father's death, he and his brother Giuliano were declared the chiefs of the state. Giuliano was assassinated in the Pazzi conspiracy 1478; but Lorenzo escaped. The conspirators included the archbishop of Pisa; and Florence was invaded by Pope Sixtus IV and the king of Naples, who was won over by Lorenzo in 1479, and peace was made. An able diplomatist, Lorenzo cultivated the friendship of Milan in order to weaken Venice. He consolidated his power at home by creating a subservient senate, and won popularity by lavishing his wealth on the city, which he raised to great splendour. Himself a poet and scholar, he assembled a brilliant group of literary men, both Greek and Italian, at his court, and encouraged painters and sculptors. He enriched the Laurentian library with priceless MSS., collected antique sculpture, founded a Platonic academy, and numbered Politian and Pico among his friends. Lorenzo, who was styled the Magnificent, died April 8, 1492. *Consult* Lives, D. G. Loth, 1930; G. Maguire, 1936.



Medici. Members of the famous Florentine family. Left to right: Cosimo the elder; Cosimo (d. 1574); Giuliano (by Botticelli); Lorenzo (by Titian)

person wilfully and falsely to pretend or imply that he is registered. Further, no one not fully registered may sue for any fees or hold a public medical appointment or give a medical certificate valid for public purposes. The profession is under the control of the General Medical Council (*q.v.*), which publishes annually the medical register of all registered practitioners, and is itself to some extent under the supervision of the Privy Council. Under the National Health Service Acts lists are kept of practitioners providing medical services in each area. Any name may be removed from a list by a tribunal if it considers the inclusion of the person on the list is prejudicial to the efficiency of the services. There is an appeal to the Minister of Health.

Fully registered practitioners, if practising, are exempt from jury service.

Medical Research Council. British organization established in 1913 as the Medical Research Committee. It received a royal charter as the M.R. Council on April 1, 1920. It is under the

to the old pre-eminence, and in 1513 the third brother, Giovanni, became Pope Leo X (*q.v.*).

Two years after Leo's death in 1521, Giulio de' Medici, an illegitimate nephew of the great Lorenzo, became pope as Clement VII, and died in 1534. Meanwhile Florence had been ruled by other members of the Medici family or by nominees of the Medici popes; and in 1530 Alessandro de' Medici was recognized as hereditary duke of Florence by the emperor Charles V. After a vicious and tyrannical career, he was murdered by his cousin in 1537. As dukes, and from 1569 as grand dukes, the family continued to reign in Florence until the line became extinct in 1737. Two of the daughters of the house became queen consorts of France: Catherine de' Medici, wife of Henry II, and Marie de' Medici, second wife of Henry IV.

Medici, COSIMO DE', THE ELDER (1389-1464). Florentine despot. The elder son of Giovanni de' Medici, he inherited great wealth. On the deposition of Pope John XXIII, he ransomed him from the duke of Bavaria, and sheltered him

MEDICINE AND ITS MASTERS

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A history of medicine, this article forms a useful commentary on those dealing with the various diseases, e.g. Leprosy; Smallpox; Tuberculosis; Typhus, etc. See also Anaesthesia; Anatomy; Bacteriology; Physiology; Surgery; the biographies of Harvey, Hunter, Jenner, and others

The earliest group of scientific medical documents is the Hippocratic Collection, put together about 300 B.C. Only a small portion is by Hippocrates, and some portions are at least as old as the 6th century. Even the most ancient of these evidently implies a long and settled civilization, but of this earlier history we are almost ignorant. As regards the knowledge that they contain, the strongest feature of the Hippocratic writings is close and accurate observation of the course of disease and consequent accuracy of prognosis, and, within certain limits, also of diagnosis. The general theoretical basis of the collection is that doctrine of the humours which lasted till the 18th century. As regards treatment, the best and clearest works are the surgical, especially that on fractures and dislocations, the treatment of which is in many cases that of current practice. The weakest feature is the ignorance of anatomy, making accurate diagnosis often impossible. There is no evidence of dissection.

The lack of anatomical knowledge was partially repaired by the Lyceum in the 4th, and by the Alexandrian school in the 3rd century. Both these bodies made advances also in experimental physiology. The result of this evolution is evident in the work of Celsus at the beginning of the 1st century A.D. Celsus gives a very exact account of surgical practice, and has an accurate though limited knowledge of anatomy. He is clear and definite in prognosis and diagnosis, while his line of treatment, especially in surgery, is sane, useful, and humane. He is totally devoid of any theurgic element. Dioscorides, who acted as surgeon in the service of Nero, carried on the botanical work of Theophrastus (370-286 B.C.), the pupil of Aristotle, and adapted the knowledge of herbs to medical purposes.

Galen's Great Work

The 2nd century of the Christian era is a very brilliant period in medical history. Rufus of Ephesus and Soranus of Ephesus made anatomical and physiological investigations, but especially industrious and scientific was Galen of Pergamum. His books form a "gigantic encyclopaedia of the

knowledge of his time. He gave us the four classic symptoms of inflammation, differentiated pneumonia from pleurisy, was the first to mention aneurism, and described the different forms of phthisis, mentioning its infectious nature." (Garrison.) He dissected a number of animals and gave accurate anatomical descriptions. He made numerous physiological experiments, and though his deductions were often hasty, his methods were sound.

The ages that followed Galen seized on his conclusions rather than his methods, and progressively misunderstood them. The flickering light of medical science burned for a while in Magna Graecia, and was still dimly glowing at Salerno in the 11th century, when it was fanned into a feeble flame by Arabian learning. From the 8th until the 12th century the intellectual hegemony was with the Orient, whither Greek learning passed. This material was received again into the West by retranslation from Arabic into Latin, and provided the staple medical treatises from the 12th to the 16th century.

Harvey and Modern Medicine

With the 16th century this was changed. Among the earliest medical writers to free themselves from Arabian tradition was Fracastor, who placed the theory of infection on a sound basis, and Paracelsus, who introduced chemical conceptions into medicine. It was, however, the anatomists who did most to create the new era in medicine, and among them the greatest was Vesalius. His anatomy was used by Ambroise Paré for the improvement of surgical technique. The absence of exact anatomical description had hitherto rendered rational physiology impossible, but now the researches of Michael Servetus, Mateo Realdo Colombo, and Hieronymus Fabricius culminated in the immortal work of William Harvey, whose discovery was published in 1628.

The circulation of the blood is the central doctrine of modern medicine, and its acceptance and comprehension were essential for that progress in all departments which characterised the 17th century. This period saw the first application of the microscope, with which the names of Galileo, Mar-

cello Malpighi, Anthony Leeuwenhoek, and Robert Hooke are associated.

The earliest years of the 18th century saw clinical teaching placed on a recognized footing by Hermann Boerhaave, for foreign students flocked to him at Leiden, and his reputation became world-wide. Among his most famous pupils were Albert von Haller, perhaps the most learned of all physicians and a profound and original physiologist, Sir John Pringle, the pioneer of antiseptic, who did much to humanise warfare and to organize an efficient ambulance service, and William Cullen, who lacked originality, but who introduced improved methods of medical teaching into England. With these men may be mentioned three great English clinicians, William Heberden, a man of one book which absorbed his whole life and contained numerous valuable observations on general medicine, John Huxham, who did valuable work in epidemiology, and Edward Jenner, whose name will always be associated with vaccination.

All these names pale before the brilliance of John Hunter, who is to be classed with the very greatest names in medicine. "His permanent position in science is based upon the fact that he was the founder of experimental and surgical pathology and a pioneer in comparative physiology and experimental morphology" (Garrison). Important Continental contemporaries of Hunter were Leopold Auenbrugger, the discoverer of auscultation, and Giovanni Morgagni, who did for pathology what Vesalius had done for anatomy. In England the work of Morgagni was continued by Matthew Baillie.

Some French Pioneers

In the early part of the 19th century the greatest advances were made in France, where Pierre Louis, the founder of medical statistics, René Laennec, the inventor of the stethoscope and elucidator of thoracic disease, Pierre Bretonneau, the epidemiologist, Jean Nicholas Corvisart, the founder of modern cardiology, Philippe Pinel, the reformer of the asylum system, and Marie François Bichat, the father of modern histology, form a very remarkable group.

Somewhat later in the field appeared the Austrians, Skoda, the great clinical expert, Rokitansky, with his vast pathological experience, Hebra, the founder of scientific dermatology, Semmelweis, who introduced antiseptic

methods into midwifery, and Politzer, one of the earliest of the modern specialists. These men contributed to the high reputation of the Vienna school. In Germany the men of distinction in the mid-19th century were more scattered than in Austria. Among them were, the histologists Friedrich Henle, Rudolph Kölliker, and Wilhelm Waldeyer. H. L. F. von Helmholtz takes his place in medicine as a physiologist, and as inventor of the ophthalmoscope. Hoppe Seyler, Rudolph Virchow, Albert Billroth, and Johann von Esmarch all did fundamental work.

The same period in England was marked chiefly by clinical, and especially surgical advance, following the stimulus of Hunter. Here Charles Bell attained distinction alike in surgery, anatomy, physiology, and art; Sharpey and Bowman followed in the footsteps of Abernethy in the organization of medical teaching; Astley Cooper, Syme, Liston, and Brodie laid the foundation of more recent surgical developments. Towards the end of the period in which these men lived surgery was revolutionised by the introduction of anaesthesia in America by Morton. This was popularised later in Great Britain by the obstetric practice of Simpson.

Contemporary Developments

The latest period of medicine has been profoundly influenced by two men, neither of whom possessed a medical diploma. Darwin, by placing the doctrine of evolution on an observational basis, gave a new stimulus and meaning to all forms of biological research, while Pasteur, and after him Koch and Lister, by their demonstration of the germinal origin of pathological processes, elucidated a vast number of phenomena which were previously inexplicable.

The great practical changes thus wrought have been the universal adoption of aseptic principles in surgery and the rise into the front rank of importance of the study of infective phenomena in medicine. Preventive medicine and aseptic surgery have saved more lives than any previous medical measures, and they have become of great economic importance, since by reducing deaths they have counterbalanced some effects of the fall in the birth-rate that has set in almost universally.

Bibliography. Medical History from the Earliest Times, E. T. Withington, 1894; Introduction to the History of Medicine, F. H. Garrison, 4th ed. 1929; Great Doctors, H. E. Sigerist, Eng. trans.

1933; History of Medicine, D. Guthrie, 1945; Short History of Medicine, C. Singer, 2nd ed. 1945.

Medicine, FORENSIC, OR MEDICAL JURISPRUDENCE. The application of medical knowledge to purposes of the law. The most frequent occasions for its employment occur in the investigation of sudden deaths or deaths from causes other than natural. In the coroner's court, the police court, and the higher criminal courts, knowledge of medicine aids the law in the detection of crime. When a dead body has been found, the medical jurist may be called upon to express opinion as to the time which has elapsed since death.

Various forms of deaths from violence, *e.g.* hanging, strangulation, drowning, shooting, poisoning, leave distinctive features in the body, by the aid of which it may be possible to determine whether death was due to accident, suicide, or homicide. Among the living, various matters relating to birth or sex may demand the help of the medical jurist, such as questions arising in connexion with illegal operations, suits for nullity of marriage, and questions of paternity. Another sphere in which the law seeks the help of the medical man is insanity. Certain stringently enforced conditions must be complied with before lunatics can be certified as insane. Medical evidence is also required when irresponsibility for crime on the ground of insanity is pleaded in a criminal charge, and in questions relating to the validity of wills or contracts made by persons who are alleged to be insane.

Finally, the sphere of medical jurisprudence is now held to cover numerous matters pertaining to the conduct and control of medical practitioners, such as the constitution and functions of the General Medical Council; the question of professional secrecy; and the obligation of a medical practitioner to exercise reasonable skill and care in the treatment of patients.

The earliest rules governing medical practitioners occur in the Hammurabi Code (*q.v.*). Moses laid down laws for the examination of and report on wounds. In ancient Egypt medical practice was governed in detail by law. Among the Greeks medicine was comparatively free from restriction by law. The celebrated oath of Hippocrates enunciates the ethical principle which is today regarded as binding upon medical men generally, namely, that information gained at the bedside shall be regarded as inviolable. In Rome, under the republic, medicine was closely controlled by law. Justinian dealt with questions of impotence, hermaphroditism, etc., and fixed the maximum duration of pregnancy at 300 days.

Medical jurisprudence became a distinct branch early in the 16th century, and George, bishop of Bamberg, in 1507 drew up a code for medical evidence in courts of law. One of the earliest applications of medical jurisprudence was in the investigation of witchcraft, and about 1545 Dr. Johannes Wier of Arnhem published a book attacking the folly and superstition of witchcraft. This drew upon him the fury of the Church, and the book was placed upon the Index. The earliest work on the subject published in Great Britain was Dr. Samuel Farr's Elements of Medical Jurisprudence, 1787. A chair of medical jurisprudence was established in Edinburgh University in 1806. On the Continent, the science was developed by Fodere and Tardieu in France, Orfila in Spain, Casper in Berlin.

Medicine Hat. Town and co. of Alberta, Canada. The co. is in the S.E. of the prov., and contains the E. section of the best ranching country. The city stands on the S. Saskatchewan river, 176 m. S.E. of Calgary and 656 m. W. of Winnipeg. It is served by the main line of the C.P.R. The buildings include the Dominion Lands Office, general hospital, churches, and schools.



Medicine Hat, Alberta, Canada. View of the town, showing Riverside Park between the two bridges

It is the trading centre for a large district, and among the industries are the manufacture of flour, bricks, and cement. Natural gas is used for generating power. Coal and shale are found in the neighbourhood. Pop. (1951) 16,364.

Medicine-Man. A practitioner of the healing art and cognate mysteries in primitive culture. The

term, now generally preferred to the synonym witch-doctor, conveniently embraces such native names as the Eskimo *angekok*, the S. American *paya*, the Hausa *bori*, and the Zulu *inyanga*. It implies the professional exercise of magical powers in the treatment of disease, in prophecy, sorcery, making rain, ensuring success of crops or hunt-



Medicine-Man. Medicine-Owl, famous Medicine-Man of the Blackfoot Indians in Montana, U.S.A.

ing, and kindred activities. Usually set apart by initiation into the conventional secrets of their vocation, carrying their mysteries in a medicine-bag, and wearing a distinctive dress, medicine-men profess to control physical and psychical phenomena by various means, including incantation, dancing, drums, rattles, horns, sacrifice, appeal, amulets, ventriloquism, sleight of hand, and suggestion. In some cultural regions are added such preventive and curative methods as sweating, massage, counter-irritation, blood-letting, empirical decoctions, emetics, and crude surgery. See Exorcism; Magic; Rain-making Customs.

Medick (*Medicago falcata*). Perennial herb of the family Leguminosae.

A native of Europe (including the E. counties of England), India, and N. Asia, it attains a height of 6 ins. to 2 ft., and has leaves



Medick. *Medicago sativa*, flower sprays of a Mediterranean medick

consisting of three variable leaflets, with a pair of slender stipules at the base of the leaf-stalk. The yellow, occasionally violet, flowers are clustered in short sprays, and the seedpod is sickle-shaped. Another species is the black medick, or nonsuch (*M. lupulina*), a trailing biennial with its yellow flowers in an oval head, like a miniature hop-cone. The smooth, kidney-shaped pods of this species are black when ripe. Several others occur, but are rare in England. Lucerne (*q.v.*), or purple medick (*M. sativa*), a plant of the Mediterranean region, is largely grown as a green fodder plant, and has become naturalised here.

Medina. City of Arabia. It lies about 240 m. N. of Mecca, and is connected by the Hejaz rly. with the Palestine, Syrian, and Baghdad rlys. It is the second holy city of the Muslims, because it contains the tomb of Mahomet, and it is often called the Prophet's City. The tomb stands in a mosque of great magnificence, which is the chief feature of the place. The residence of Mahomet after his flight from Mecca, 622, it was also the home of the earliest caliphs. As a terminus of the Hejaz Rly., which reached it in 1908, Medina has a considerable trade. Its port on the Red Sea is Yembo, 125 m. to the S.W.

Before the First Great War all non-Muslims were rigidly excluded from it, but, like Mecca, it was visited by Burton and other Christian observers. During the First Great War it was attacked by the Hejaz army, in 1916, but the attempt failed. Thereafter it was invested, but somewhat loosely, and it did not finally yield till Jan., 1919, when, on representations from Constantinople insisting on its compliance with the terms of the armistice, its garrison laid down their arms. Pop. 50,000, but this number is greatly exceeded during the pilgrimage season.

Medina Sandstones. In geology, a group of sandstones, etc., of Silurian age, occurring near Medina in Orleans co., N.Y., where they are quarried for building.

Medina Sidonia. A town of Spain, in the prov. of Cadiz. It stands on a hill overlooking the Sequillo river, 20 m. S.E. of Cadiz. A ruined castle of the dukes of Medina Sidonia crowns the hill. The town is noted for its pottery. Pop. (1950) 14,889.

Medina Sidonia, ALONZO PEREZ DE GUZMAN, 7TH DUKE OF (1550-1615). Spanish admiral. Born Sept. 10, 1550, a member of the famous Spanish house of Guzman, he was chosen by Philip II of Spain to command the Armada sent against England in 1588, on the ground that his rank

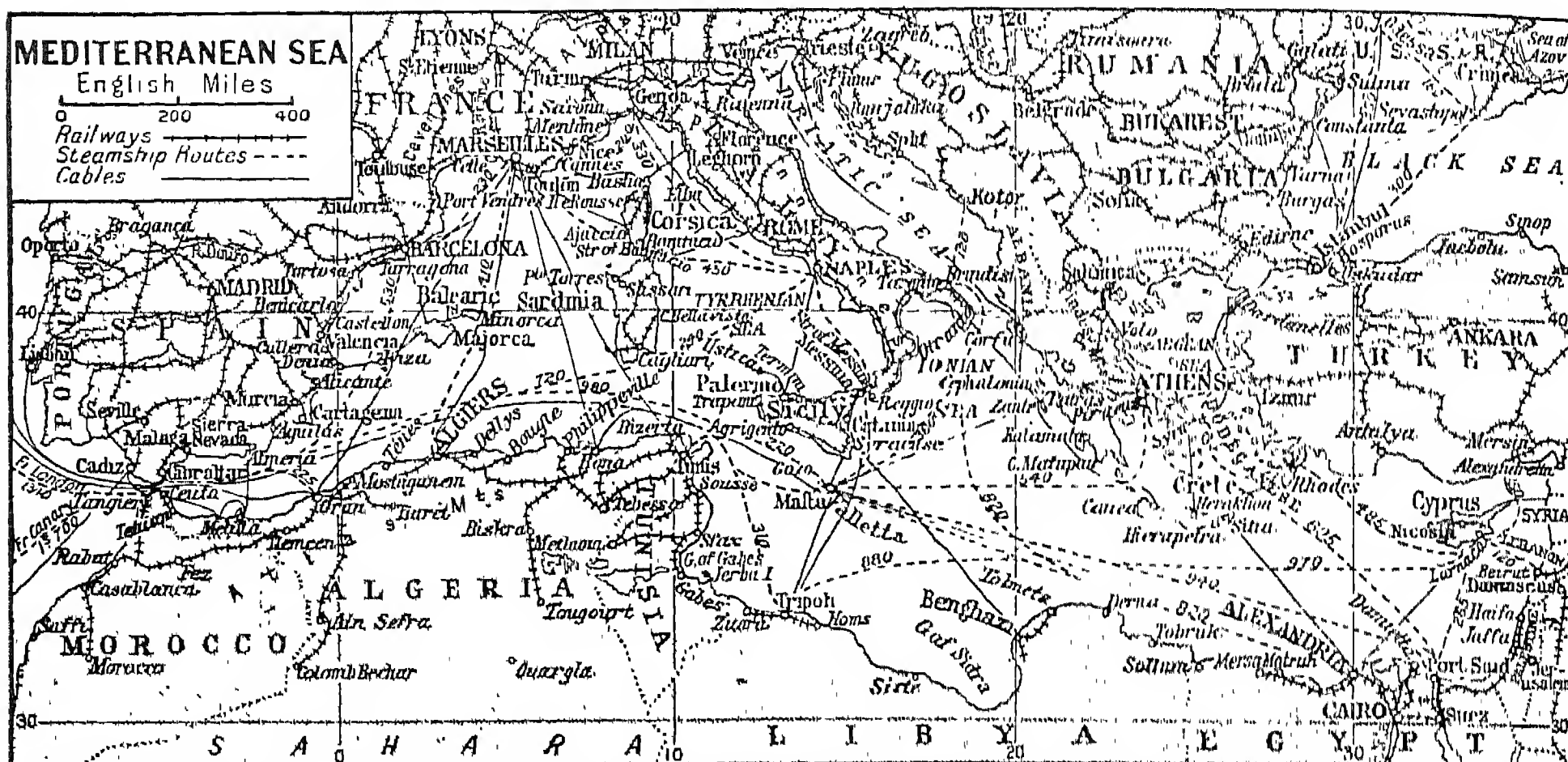


Medina, Arabia.

Main street of the city, leading to the tomb of the Prophet

as the highest of Spanish grandees would ensure obedience. He had no qualifications, and was to be guided by advisers and instructions. On his return he hid himself in his palace at San Lucar. Subsequent disasters to the Spanish navy under his charge were the failure to protect Cadiz from the British and Dutch in 1596, and a defeat off Gibraltar in 1606. See Armada.

Medinet-el-Fayum OR FAYUM. City in Fayum prov., Egypt, 25 m. S.W. of Cairo by rail. It is picturesquely situated on a branch of the Bahr Yusuf. Pop. (est.) 80,000. The ancient Shedet, it was the seat of the worship of the crocodile god



Mediterranean Sea. Map of the world's largest enclosed sea, which lies between Europe, Asia, and Africa, has one connexion, the Straits of Gibraltar, with the open ocean, and is fed directly by one great river, the Nile

Sobek; the Greeks named it Crocodilopolis, but Ptolemy II Philadelphus renamed it Arsinoë in honour of his sister-wife. The mounds of Arsinoë, N. of the town, have yielded rich finds of papyri.

Medinet Habu. Early Christian village on the W. plain of Thebes, Upper Egypt. Its more ancient remains include Rameses III's funerary temple, approached through a three-storied pavilion with inverted battlements of Syrian design. Its sculptured scenes commemorate Egyptian victories over sea raiders, among them Philistines, and include the earliest representation of a naval battle.

Mediolanum. See Milan.

Meditations of Marcus Aurelius, THE. Volume of thoughts setting forth the Stoic philosophy as received and modified by the emperor Marcus Aurelius Antoninus. The work has long occupied a prominent place among ethical writings, and is notable for being suffused and softened by almost Christian feeling. Well-known Eng. trans. are by Jeremy Collier, 1701; George Long, 1862.

Mediterranean Fleet. Title of units of the Royal Navy serving in the Mediterranean Sea. Entrusted with the maintenance of imperial lines of communication with India, the Far East, and Australia, and with the defence of the northern termination of the Suez Canal, the fleet was based on Malta and Alexandria until the latter port was handed over to the Egyptian government in 1946. It is not concerned with the defence of Gibraltar, which is the joint responsibility of the army and the Home Fleet. Between the two

Great Wars the strength of the Mediterranean force was kept at such a level that, in conjunction with the French navy, parity was maintained with the Italian navy.

The fleet was heavily reinforced after the surrender of France in June, 1940, but was always numerically inferior to the Italians. If it had not succeeded in controlling the eastern basin of the Mediterranean in 1940-41, Malta, Alexandria, and Port Said might all have fallen, the campaigns in Abyssinia, Libya, and Syria could scarcely have been conducted, and the British position in the Middle East would have been jeopardised. In addition to defeating the Italian navy, hunting U-boats, and withdrawing the army from Greece and Crete, the Mediterranean fleet also escorted vital Malta convoys. See Mediterranean Theatre.

Mediterranean Sea (Lat. *media*, middle; *terra*, land). Largest expanse of inland water in the world. It washes the shores of Europe, Africa, and Asia, and is, physically, a relic of a much larger sheet of water which extended in earlier geological times E. and N.E. to the Arctic. To the S. and S.E. is the geologically old plateau of Africa, to the N. the comparatively young mountains of S. Europe.

It comprises three basins: E., central, and W. The E. basin, about 1,200 m. long, between Sicily and Palestine, is almost surrounded by the plateaux of Asia Minor, Syria, and Palestine; most of it is more than a mile deep, while the greatest depth, 14,400 ft., has been sounded between Malta and Crete. The W. basin is about 960 m. long, and is deepest in the Tyrrhenian

Sea, 12,200 ft. This basin has been left by a foundering of ancient land, and round it there are still areas of weakness in the earth's crust; round it also the mountain system—Atlas, Apennines, Alps—belongs to the same geological period, the Tertiary, when the backbone of Europe was made. The central basin S. of Sicily is comparatively small, 200 m. long, and shallow, with a maximum depth of 4,200 ft.

The Adriatic Sea is shallow at the N. end and deep in the S., where the sea occupies an area which used to form the geologically ancient Dalmatia; the Aegean Sea, with its scattered islets and scattered deeps, similarly occupies part of an ancient Aegean plateau. The large islands of the Mediterranean are either relics of ancient land-masses—Corsica and Sardinia of the ancient Tyrrhenis, Chios and Rhodes of the ancient Aegean plateau—or they are detached fragments of the great E.-W. mountain system of Eurasia. The Balearic Islands connect the Sierra Nevada and the Alps; Sicily joins the Atlas Mts. to the Apennines, while Crete and Cyprus connect the Pindus Mts. with the Taurus Mts. and the Caucasus.

The waters of the Mediterranean evaporate very rapidly, for immediately to the S. is the rainless Sahara. During summer the Mediterranean area is almost everywhere arid and hot. Rains fall in the late autumn and winter, but the total quantity is small. The Nile is the only great river which feeds the sea directly, and its output is small except during the flood, and the flood water is gradually

being retained for irrigation; the output of the Po, Rhône, and Ebro is of little value.

The Mediterranean has two water gates; one to the Black Sea in the N.E. and one to the Atlantic Ocean in the W.; each is a sill between deep basins on either side. Because of the great evaporation, the water of the Mediterranean Sea is more saline and denser than the waters beyond the sills, so that in each case lighter and fresher water flows into the Mediterranean Sea as a surface current, while saltier and heavier water creeps over the sill as an outward current of less volume. The Mediterranean Sea is virtually tideless.

The hot, dry, almost cloudless summers and the warm winters of the Mediterranean area, with their accompaniment of rain, have produced a definite type of vegetation which can survive the summer scorching.

Cradle of Western Civilization

It is one of the commonplaces of the history of Western civilization that progress came westward along the Mediterranean; from Levantine sources in ancient times Rome learned from Greece and Egypt, from Levantine sources in the Middle Ages Christian Europe learned from the Saracen. From the Mediterranean Western Europe learned the art of seamanship; from the trading communities of the Italian peninsula Western Europe imbibed ideas of cooperative companies of merchant adventurers, with the consequence that England achieved through the East India, Hudson Bay, and other companies, the possession of large areas overseas. Of these India was early of greatest value, and the need for quick transit between the U.K. and India eventually led to the cutting of the Suez Canal, and to the British interest in Egypt. *See* Aragon; Atlantic; Levant; Sea-Power.

Mediterranean Theatre OF OPERATIONS. After the opening of the Suez canal, 1869, control of the Mediterranean, in order to maintain imperial communications with India, the Far East, and Australasia, became a prime object of British policy. Until the advent of the submarine and of bombing from the air, Great Britain's strategic position in the Mediterranean proved unassailable. With naval bases at Malta and Gibraltar, she required only a comparatively small army to defend the canal; sea power made it possible for British Mediterranean garrisons to be reinforced at will, while the arid Sinai, Western, and Libyan deserts

protected Egypt against invasion by land.

Britain's strategic strength in the Mediterranean first showed deterioration in the First Great War, when German submarines took heavy toll of Allied shipping using the inland sea. After that war the increasing range and power of land-based artillery suggested that, while Gibraltar might remain impregnable against direct assault, it was no longer a safe naval base in the event of a hostile Spain. Because of its central position, beyond the range of coastal artillery, Malta was developed as the principal British naval base in the Mediterranean.

Italy's rise under Mussolini and her development of bombing aircraft altered the strategic position of Great Britain in the Mediterranean considerably. From bases on the Italian mainland, the Dodecanese Is., and Pantellaria, Italian bombers, submarines, and surface craft could render extremely dangerous the passage of British shipping through the Sicilian channel and adjacent waters, and threatened the security of Malta. The construction by Mussolini of a motor road along the 1,100 m. of seaboard from Tunisia to the Egyptian frontier, and his maintenance of a large and mobile army in Libya, became a potential threat to the security of Egypt; and operations of Italian mechanised columns in the suppression of tribal revolts showed that the desert was no longer impassable.

The Second Great War

When war broke out in Sept., 1939, Great Britain and France had a good margin of strategic advantage in the Mediterranean; a considerable British fleet was based on Gibraltar, Malta, and Alexandria, while a large part of the French navy was concentrated at bases on both sides of the western Mediterranean. Italy through her seizure of Albania (*q.v.*), had complete control of the Adriatic.

With the defeat of France and the entry of Italy into the war in June, 1940, Italy's formidable naval forces were ranged against the R.N., deprived not only of the aid of the French fleet, but also of the use of French bases in the Mediterranean; while French armies in Syria, Tunisia, Algeria, and Morocco, remaining under Vichy control, were lost to the British cause.

Immediately after her declaration of war, Italy opened a submarine campaign which resulted in the sinking of a considerable number of British ships. How-

ever, the Italians, despite their numerical superiority, preferred to preserve their cruisers and battleships. The R.N. made up for its weakness by an aggressive policy of seeking out Italian warships and bringing them to action.

The first surface action was on July 9, 1940, when a British squadron made contact with Italian battleships and cruisers E. of Malta; an enemy cruiser and a battleship were damaged before the Italians found refuge under their shore batteries. Ten days later the Italian cruiser Bartolomeo Colleoni (*q.v.*) was sunk by the Australian cruiser Sydney.

Struggle by Sea and Air

But it was Axis air power, particularly when it passed under the operational control of the Luftwaffe, that was the most serious threat to the British Mediterranean position. On June 11, 1940, Italian aircraft made their first raid on Malta, beginning an air siege that was to last for over two years. British routes through the Mediterranean were severed, and even naval communication between the bases at Gibraltar, Malta, and Alexandria became hazardous.

On Oct. 28, 1940, Italy attacked Greece (*q.v.*), and the R.N. and the R.A.F., coming to the support of the Greek navy and to ensure a flow of supplies and reinforcements to the Greek army, established air and naval bases in Greece and on Crete. The increase in British strategic naval and air power resulted in the offensive that captured Benghazi, Feb. 6, 1941.

Italy concentrated her main fleet at Taranto to protect the Adriatic. On Nov. 11, 1940, 19 torpedo-carrying aircraft from the carriers *Illustrious* and *Ark Royal* (*q.v.*) attacked the anchored warships and put three battleships and two cruisers out of action.

Early in 1941, the Luftwaffe virtually replaced the Regia Aeronautica, and air attacks on British ships, especially by dive-bombing, greatly increased; while Italian submarines, officered by Germans, intensified underwater attack.

An Allied naval bombardment of Genoa, Feb. 9, 1941, seriously disorganized for a time Axis supplies to N. Africa. At the same time, a concentrated air attack on a large British convoy to Greece was beaten off, though the cruiser *Southampton* was sunk and the carrier *Illustrious* badly damaged.

On March 27, 1941, Adm. Cunningham, c.-in-c. British Mediterranean fleet, received reports from air reconnaissance that a consider-

able Italian fleet was making for Crete. Putting to sea from Alexandria, he made contact with the enemy off Matapan (*q.v.*), and in the subsequent action sank three cruisers and two destroyers, and damaged one battleship. Matapan was a signal victory for the R.N., but while the British fleet had been drawn off by the Italian sortie, the enemy had moved a large convoy from Italy to N. Africa which enabled the Axis armies to force the British back to the Egyptian frontier once more, and the R.N. was confronted with the further heavy task of supplying the British garrison left behind at Tobruk.

On April 6, 1941, German armoured divisions invaded Greece and Yugoslavia. Within three weeks the Allies had to evacuate the Greek mainland, an operation completed under cover of the R.N. on May 1. A gallant stand was made on Crete, but this, too, was evacuated May 28–June 1 under naval cover for the loss of three cruisers and four destroyers.

The Turning Point

Throughout the rest of 1941, the British position in the Mediterranean gradually worsened. On Nov. 14 the carrier Ark Royal was torpedoed and sunk, to be followed by the Australian cruiser Sydney six days later. On the 24th the cruiser Dunedin was lost, on the 25th the battleship Barham; shortly afterwards the Queen Elizabeth was damaged. After the Japanese attack on Malaya, British naval ships were transferred from the Mediterranean to the Far East, and at one period the heaviest British naval force in the Mediterranean consisted of three cruisers.

By continuing its aggressive policy, however, the R.N. concealed its weakness. British destroyers and submarines, the R.A.F. and Fleet Air Arm between them, despite the cover provided by enemy aircraft based on Crete, destroyed at least half the Axis transports and supply ships for N. Africa; some 40 British submarines were lost in these operations. Nevertheless the Axis was able to build up and maintain in N. Africa an army of 150,000 men.

But the British managed to retain air and naval control over the S.E. Mediterranean, though by June, 1942, the British armies in N. Africa had been forced back a second time to the Egyptian frontier, Tobruk had been lost, and the maintenance of Malta imposed a constant drain on ships, aircraft, and men. The central Mediterranean was almost untenable even

for British naval craft. The evil effects of this situation became apparent politically in the attitude of Spain, Turkey, and Vichy France.

Then came the decisive British victory at Alamein and the Anglo-U.S. landings in French N. Africa. When the 8th army captured Tripoli, the Mediterranean, from Gibraltar to Alexandria, was virtually closed to Axis ships, and the German armies in N. Africa were trapped. Now in complete command of the air, Allied aircraft were able to prevent all but a few of the enemy being flown out, and on May 12, 1943, the last enemy forces in N. Africa surrendered. Malta immediately became an advanced base, Algiers becoming the main Allied base for Mediterranean operations until this was transferred to Italy, June 30, 1944. After the 8th army entered Tunis, by arrangements made at Casablanca in Jan., 1943, the command was reorganized, with Gen. Eisenhower supreme c.-in-c. of all Allied forces, Gen. Alexander as his deputy, in charge of ground operations, Air Marshal Tedder, as air c.-in-c., and Sir Andrew Cunningham as c.-m.-c. Mediterranean naval forces. Pantellaria (*q.v.*) surrendered to the Allies on June 11, and Lampedusa (*q.v.*) the next day; and on July 10 Allied troops landed on Sicily with little air or naval interference from the enemy. Italy capitulated unconditionally to the Allies on Sept. 3, and on the 10th the surrendered Italian fleet reached Malta. On Sept. 3 also the Allies invaded Italy, thus securing their first foothold on the European mainland. Corsica was liberated between Sept. 13 and Oct. 4; and the Germans evacuated Sardinia, Sept. 18, but they did not, as the Allies had hoped, evacuate Italy. Instead they turned their former ally's country into a battleground over which the longest drawn-out and one of the most destructive campaigns of the war was fought. In the Mediterranean basin, however, despite such setbacks as the occupation by the Germans of the Dodecanese (*q.v.*), the Allies now had supremacy in the Mediterranean; a supremacy that made possible the landing on the French Riviera against negligible opposition except on land in Aug., 1944. See Crete; Eighth Army; Gibraltar; Greece, Campaign in; Italy, Cam-

paign in; Malta in the Second Great War; North Africa Campaigns; Royal Navy; Second Great War, etc.

Mediterranean Stages. In geology, two subdivisions of the Miocene. The first Mediterranean stage resulted in the marine deposits on the floor of the great Hungarian Sea, and comprises the first Miocene period. During the second stage, corresponding to the third Miocene period, the Hungarian plain was again covered by the sea. Between these stages the plain was covered by a series of salt lakes. See Miocene.

Medjerda. Tunisian river. It rises near Khamissa, between Tebessa and Suk-Ahras in Algeria, and flows about 300 m. eastwards. It enters Tunisia through wild gorges and falls into the sea through the salt lake at Porto Farina. It is much too rapid to be navigable. Its valley was the scene of violent fighting during the Second Great War. See North Africa campaign.

Medlar (*Mespilus germanica*). Hardy tree, member of the family Rosaceae. It is a native of Greece,

Persia, and Asia Minor, and is found wild in Britain occasionally, though it is not indigenous. As a wild tree it has spiny branches, but in orchards the spines disappear. The lance-shaped leaves are downy on the underside, and the solitary white flowers are 1½ in. across, with woolly calyx. These appear



Medlar. Fruit and leaves of this hardy tree

in May or June, and give place to the globular green fruit, which has the depressed top marked out by the persistent calyx-lobes. It has a sub-acid flavour. It thrives in any ordinary moist soil. The fruit should be stored in a cool room to "blet" until it is brown and on the verge of decomposition. It is useful for flavouring purposes and for making jellies. Medlars are propagated by budding or grafting on pear or quince stocks.

Medmenham. Parish and village of Bucks, England. It is 3 m. S.W. of Marlow. A Cistercian abbey was founded here in 1204. On the site a residence was built, where, in the 18th cent. Sir Francis Dashwood established a mock order of Franciscans, notorious as the Hell Fire Club. Medmenham was a photographic interpretation centre of the R.A.F. in the Second Great War. *Pron.* Mednam.

Médoc. Dist. of France, W. of the Gironde estuary. The chief subdivision of the Gironde viticultural region, it produces little white wine, but yields some of the most famous varieties of red Bordeaux. Vineyards in the parishes of Pauillac, Margaux, St. Julien, etc., give the Médoc wines their specific names.

Medulla. Biological term applied to the marrow of the bones, especially the spinal cord. It is also used to describe the central nuclei of organs such as the kidney, and, in botany, to the pith of stems, roots, and other parts of plants which are constructed in layers. The medulla oblongata is the lowest part of the brain, containing the nuclei of cranial nerves, which govern such vital functions of the body as respiration and the movements of the heart.

Medum OR MEYDUM. Ancient necropolis on the left bank of the Nile, 40 m. upstream from Cairo, Upper Egypt. It contains the oldest true pyramid, attributed to Sneferu, predecessor of Khufu. Mastaba-tombs of IVth dynasty officials yielded some of the best-known works of Old Kingdom art, notably the incomparable statues of Rahotep and his wife Nefert, and a fresco of geese, in the Cairo Museum. *Pron.* maydoom.

Medusa. In Greek mythology, one of the three Gorgons. *See* Celini, B.; Gorgon; Perseus.

Medusa. Name applied to many types of jelly-fish (*q.v.*) which assume the form of free-swimming bells or parachutes. They are marine animals, and vary in size from microscopic forms to bells measuring over 6 ft. in diameter. Many species occur round the British coasts, but the finest are restricted to the tropics. Fossil remains of medusae are rare on account of their structure, but some have been found in Cambrian and Jurassic rocks. These remains are nearly always in the form of impressions or casts. *See* Coelenterata.

Medway. River of England. It rises in three headstreams, two in Sussex and one in Surrey, in the Weald, and flows generally N.E. through Kent to the mouth of the Thames, which it enters by a wide estuary. Tonbridge, Maidstone, Rochester, and Chatham are on its banks, and large vessels can ascend to Rochester. Sheerness stands at the E. entrance to the estuary. Its length is 70 m., including 12 m. of estuary. The river preserves a curious distinction in nomenclature, those born on the right bank

being known as men of Kent, those on the left as Kentish men.

Mee, ARTHUR (1875-1943). British journalist and author.



Arthur Mee,
British journalist

Born at Stapleford, Notts, July 21, 1875, and educated there, he became in 1891 a junior reporter on the Nottingham Daily Express then edited by J. A. (later Sir John) Hammerton. At 20 he was editor of the Nottingham Evening News. He moved to London, edited Black and White, 1901-03, and was active as a free-lance. Lord Northcliffe made him literary editor of the Daily Mail, 1903-05; and then with the Harmsworth Self-Educator began the series of instructional books for which he is chiefly remembered. In 1908 he began the editing of the work with which his name is chiefly associated, The Children's Encyclopedia (*q.v.*), which was strikingly successful and was translated into French, Italian, Arabic, Spanish, Chinese, and other languages, selling millions of sets. Working on the same lines, Mee next developed My Magazine (first called The New Children's Encyclopedia, then The Children's Magazine). A feature of this was a supplement called the Little Paper, which in 1919 was established as a separate publication, The Children's Newspaper. He collaborated with Sir John Hammerton in the editing of some earlier publications, including The World's Great Books and series on natural history and popular science, and the life of Jesus. His last work was The King's England, a series of guides to the English counties. He died May 27, 1943.

Meegeren, H. VAN. *See* under False Antiquities.

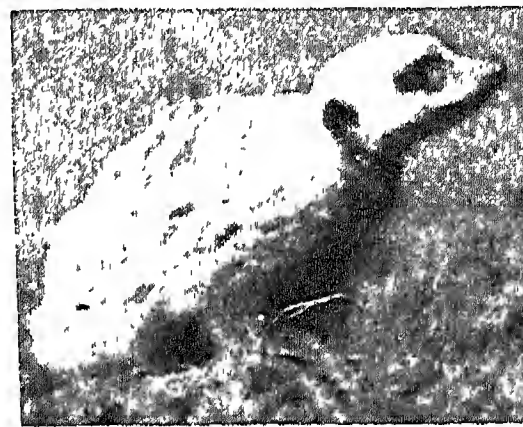
Meer, JAN VAN DER (1628-91). Dutch painter. Born at Haarlem, he was a pupil of Jacob de Wet, visited Italy when young with Lieven van der Schuur, and painted landscapes with cattle and figures. He died at Haarlem. Vermeer (*q.v.*) was also named van der Meer.

Meerane. Town of E. Germany, in Saxony. It is situated 21 m. W. of Chemnitz and 38 m. S. of

Leipzig. The chief building was a church, dating mainly from the 13th century. The town manufactured woollen goods and textiles of other kinds, also machinery.

Meeraugen Spitze. Peak of the High Tatra Mts. in central Europe, alt. 8,210 ft. It is situated near the boundary of Poland and Czecho-Slovakia, 4 m. N.W. of the Franz-Josephs or Gerlsdorfer Spitze, the culminating point in the range. It is one of the most celebrated view points in a picturesque region of peaks and lakes. To the N.W. at the foot of a sharp slope lies the lake Meerauge.

Meerkat (Dutch, sea cat) OR SURICATE (*Rhizaena*). A carnivorous mammal related to the mongoose and civet. It is about 14 ins. in length, including the tail, and its soft fur is of a greyish colour. Its sharp nose and remarkably long claws are two of its distinguishing characteristics. It is very common in Cape Colony, where it lives in burrows in the sand. Although a member of the carnivora it lives mainly on bulbs



Meerkat, a bulb-eating mammal
related to the mongoose
W. S. Berridge, F.Z.S.

which grow in the sand. It is in favour in South Africa as a pet.

Meerscham, OR SEPIOLITE. Earthy or fibrous mineral, a hydrated magnesium silicate, $2\text{MgO} \cdot 3\text{SiO}_2 \cdot 2\text{H}_2\text{O}$. It is apparently a mixture of amorphous material (meerscham) and fibrous crystals (sepiolite) and is white, greyish, or yellowish in colour. It occurs in irregular masses derived from serpentine (Asia Minor), and in siliceous veins (New Mexico); it is found in quantity also in Spain, Morocco, and the Grecian Archipelago. It is originally soft and floats on water when dry. The industrial treatment is to soak it first in tallow and then in wax before it is fashioned into pipe bowls, etc., and polished. It is occasionally used as a building stone and was formerly used as a substitute for soap in North Africa.

Meerut. Division and district of India, in the Uttar union. The division comprises the N. half of the Ganges-Jumna doab, and a Himalayan area in Saharanpur and Dehra Dun. The dist. is in the middle of the division to the N.E. of Delhi. Irrigation is necessary for a quarter of the area; the chief crops are wheat, barley, and sugarcane. Area, div., 9,230 sq. m.;

dist., 2,344 sq. m. Pop. (1951) div., 6,718,510; dist., 2,281,217.

Meerut. Town of India, in the Uttar Union. An ancient city lying N.E. of Delhi almost midway between the Ganges and the Jumna, it had lapsed into a ruinous condition until, under British rule, it became a garrison town and military headquarters. It contains 62 mosques and 60 temples; the Jama Masjid dates from 1019. S. John's church, 1821, was the first erected in N. India. Here also are five colleges of Agra University. The mutiny of 1857 broke out here. Pop. (1951) 233,183.

Meeting. A gathering of people. One of the most important constitutional rights is the right of public meeting, *i.e.* the right of persons to assemble so long as they do not commit a breach of the law. A meeting must not be held on private property without official permission. There is no general rule that meetings in a public street are illegal, but they must not amount to a nuisance, *i.e.* traffic must not be interfered with. An assembly becomes unlawful if its object is the commission of a crime or if it causes reasonable persons to apprehend a breach of the peace. By the Public Meeting Act, 1908, disorderly conduct at a meeting is a crime, and under the Public Order Act, 1936, a police officer may at the request of the chairman ask an offender for his name and address and, if he refuses or there is reasonable suspicion that he is not giving his true name and address, he may be arrested. By this last Act, the use of political uniforms in public places or at public meetings is forbidden without a permit, as is offensive conduct or the possession of offensive weapons at public meetings or processions. A borough or urban district council or, in London, the police may, with the consent of the Home secretary, forbid meetings for a period not exceeding 3 months.

During the Second Great War the Home secretary had power to prohibit meetings of certain organizations where there was a danger that the organization might be used for purposes prejudicial to the defence of the realm.

Megacycle. Term in wireless telephony denoting a million cycles. It is also used as a contraction for megacycle per second.

Megalesia. Roman festival. Instituted in honour of Rhea Cybelē, the Great Mother (Gr. *megalē mētēr*) of the gods, in 204 B.C., when a black stone, supposed

to represent her, was brought from Pessinus in Phrygia. It was celebrated April 4-10, some days before the festival of Ceres (Cerealia). The Galli or priests of Cybelē marched in procession through the streets of Rome, singing and asking alms for the goddess, and games were held on the Palatine. The festival, celebrated by patrician women, which in imperial times became more orientalised and orgiastic, was kept up until the 5th century A.D.

Megalithic (Gr. *megas*, great, *lithos*, stone). Term denoting a class of primitive stone monuments and their associated culture. These monuments are built of large, often roughly dressed stones. The stones may be erected in circles (as at Avebury, *q.v.*), or in long straight avenues (the alignments of Carnac in Brittany, Dartmoor); they may be used to build tombs (such as Bryn Celli Ddhu, Anglesey, or Wayland's Smithy, Berkshire), or they may simply be set up as solitary standing stones (menhirs). The terms dolmen and cromlech, formerly applied to various classes of these monuments, may be misleading as to their nature, and are no longer used by archaeologists.

Megalithic tombs can be classified as passage graves, in which the funerary chamber is approached by a narrow passage, and as gallery or long stone cist graves, which are simply long rectangular chambers. Their walls are built of megaliths, set upright, and the roofs may be formed of a series of capstones or of corbelled vaulting. The great majority of these graves in N.-W. Europe were originally covered by mounds of earth or stones (barrows or cairns), sometimes of very great size. Long barrows over 300 feet in length are not uncommon. The tombs were generally communal burial places, and were often in use for many generations. The dead were usually deposited unburnt, in a crouching position, and later interments were made regardless of the disturbance of earlier bones. Sometimes roughly sculptured ornamentation is found on megalithic monuments, particularly on the menhirs.

Megalithic monuments range from the western Mediterranean, Spain, Portugal, to Brittany and many other parts of France, the British Isles, especially the western parts, the Netherlands, north Germany, Denmark, and south

Sweden. There are notable tombs in Sardinia and the Balearic Islands. They have enough in common to provide strong grounds for the view that they represent the spread of some religious ideas involving special funerary practices. These ideas were probably disseminated in the first place by traders; perhaps also by colonists as they moved from one place to another on the European seaboard. The first impulse was probably given by the traders of the eastern Mediterranean, and of Crete in particular, where there are many rock-cut and beehive tombs from which the chamber and passage graves are derived: the treasury of Atreus at Mycenae is but the most famous of a large series. The trade within the Mediterranean may have been associated with the early Bronze Age quest for copper and tin, but there is no indication that the Cretans penetrated beyond the Mediterranean, and knowledge of megalithic building and associated ideas was probably passed from community to community along the Atlantic seaboard and across France, and also carried by small local groups of colonists. The megalithic culture of north-western Europe is essentially a Neolithic one; with megalith-building went the practice of agriculture, and presumably also of the rites followed by primitive man in the hope of ensuring the fertility of his seeds and an abundant harvest. Only in its latest phase in Britain, when the Beaker folk adopted megalithic construction for the building of their sanctuaries, such as Avebury and Stonehenge, does it become associated with the use of bronze.

Megalithic structures are known in many other parts of the world—in N. Africa, India, Polynesia, and central and south America; but attempts to link the Asiatic and American examples with alleged voyages of Cretans or Egyptians have proved illusory. Apart from other considerations, these distant monuments are generally much too late in date. The megalithic tombs of India, mainly of the first two centuries A.D., do, however, exhibit remarkable similarities to European megaliths. The connexion, if any, between these structures has not been elucidated. *Consult*: *Rough Stone Monuments and Their Builders*, T. E. Peet, 1912; *The Axe Age*, T. D. Kendrick, 1925; *Prehistoric England*, Grahame Clark, 1944; *The Dawn of*

European Civilization, V. E. Gordon Childe, 4th edn. 1948.

Megalomania (Gr. *megas*, great; *mania*, madness). Form of mental disturbance characterised by delusions of grandeur. The patient may believe that he is extremely rich and powerful or that he has exceptional physical prowess or intellectual abilities, or is endowed with divine powers. In a woman the delusions are commonly related to sex: she may think she is exceptionally beautiful or attractive or imagine that some famous or exalted person is in love with her. Ideas of this kind are common in the mental disorders associated with mania.

So long as sufferers from megalomania are not opposed they are happy in their delusions; but they become distressed and often aggressive and violent if they meet with rivalry or opposition.

Megalopolis. City of Arcadia, ancient Greece. Founded by Epaminondas in 371 B.C., it became a prosperous place but was captured and destroyed by the Spartans in 222. It was one of the chief cities of the Achaean League (q.v.). Considerable excavations have been made, including that of the site of the theatre, the largest in Greece.

Megalosaurus (Gr. *megas*, great; *sauros*, lizard). An extinct fossil reptile found in the Jurassic and Cretaceous deposits of Europe, part of Asia, and N. America. The reptile was a large carnivorous dinosaur, 15–20 ft. in length, possessing formidable teeth and a long, heavy tail. The megalosaurus had only small forefeet, but large hind legs, and toes with strong claws.

Megaphone (Gr. *megas*, great; *phone*, voice). Appliance for magnifying sound. One form is a speaking trumpet, formerly much used at sea to make the voice audible at a distance. It consists of a hollow cone of sheet-metal, fitted at the smaller end with a mouthpiece. A megaphone amplifies sound spoken into the mouthpiece by compelling the

sound waves to start outward from the wide end of the instrument in a cone shape. Thus they are prevented from expending their energy as quickly as they would if free to spread in all directions. At sea the megaphone has been generally replaced by the loud-hailer, a form of loud-speaker with an electronic circuit to amplify the sound.

Megara. City of ancient Greece. It was situated opposite the island of Salamis, 1 m. from the sea and about 30 m. E.N.E. of Corinth. The capital of the small district of Megaris, it became important early in Greek history, and founded the flourishing colonies of Chalcedon, Byzantium, and the Sicilian Megara. It was for some time a member of the Athenian alliance, but the connexion ceased when the pro-Athenian democratic government gave place to an oligarchy, 441 B.C. During the Peloponnesian war Megara sided with Sparta. Theognis, the poet, was a native.

The small modern town of Megara lies in the same site. Pop. 8,500. It was the centre of an area from which British Imperial troops were evacuated during the Second Great War at the end of April, 1941, after which it remained in German occupation until the German withdrawal from Greece in 1944.

Megatherium (Gr. *megas*, great; *thērion*, wild beast). Large



Megatherium. Giant ground sloth of the Pleistocene age
Amer. Mus. Nat. His.

extinct mammal, whose fossil remains are found in Pleistocene deposits of S. America. One of the Edentata, allied to the anteaters and sloths, it was about 20 ft. long, and fed upon small twigs and leaves of trees. When feeding, it supported its huge bulk on its hind legs and tail, the forearms being used chiefly for procuring food.

Fossils of the megatherium were among the earliest fossils of mammals to receive scientific attention, a skeleton being found in 1789 near Buenos Aires.

Megiddo. City of ancient Palestine, in the plain of Esdraelon. Sisera was defeated near by; Solomon restored the fortifications; and it was the scene of the deaths of Ahaziah and Josiah. The site, Tell el Mutesellim, has been extensively explored by German and American excavators, who uncovered successive layers of the Bronze Age and Iron Age city. A hoard of carved ivories of the 12th century B.C., and the stables of the Israelite kings, were among the most notable finds.

The 1st Viscount Allenby took his title of Megiddo from this place which he captured on Sept. 19, 1918. See also Armageddon.

Megohm. In electricity, a measurement of resistance equivalent to 1,000,000 ohms.

Megrims. Disease of horses. It is caused by interference with the blood supply to the brain. The horse staggers, throws up its head, and usually falls unconscious. Underfeeding and overworking are associated with the condition, but so are overfeeding and underworking. Harness horses seem most liable to attacks, possibly because of the pressure of the collar. The underlying cause is unknown and no treatment has been found.

Mehadia. Town of Rumania. It is 15 m. by rly. N. of Orsova, near the W. end of the Transylvanian Alps. The baths, frequently called the Baths of Hercules, with a temperature of 117°–132° F., were known to the Romans.

Mehemet Ali (1769–1849). Pasha of Egypt. Of Albanian parentage, he was born at Kavala, Greece, and distinguished himself in Egypt against Napoleon in 1799. In 1805 he obtained recognition as pasha of Egypt. In 1811, he massacred the Mamelukes at Cairo; later he subdued the Wahabis, and in 1818 captured Mecca and Medina. He sent his son Ibrahim Pasha to the Sudan, to extend Egyptian rule there.

In 1824 the sultan called upon Mehemet for help against the Greeks, promising him Syria as a reward. The promise, however, was not fulfilled, so Mehemet seized Syria by force, and secured a good part also of Asia Minor. The Turks, attempting to regain it, were repulsed, but Mehemet gave way when a fleet of British



Mehemet Ali,
Pasha of Egypt



Megaphone. Simple form, as used for giving directions at a distance

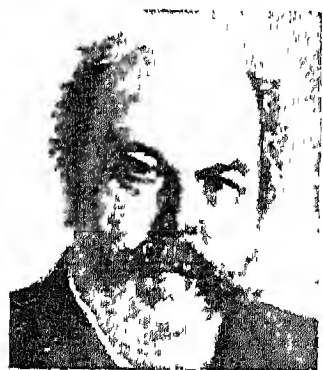
and other vessels appeared. Eventually a compromise was arranged, by which Mehemet was made hereditary pasha of Egypt and governor of the Sudan. He died Aug. 2, 1849. *See* Egypt.

Meighen, ARTHUR (b. 1874) Canadian statesman. Born June 16, 1874, in Perth co., Ontario, he graduated at Toronto, was for a time a teacher, and afterwards a barrister. He entered the dominion house of commons in 1908. A Conservative in politics, he became solicitor-general in 1913. In 1917 Meighen entered Borden's coalition cabinet as secretary of state and minister of mines. In a few months, however, he was made minister of the interior, and in 1920 succeeded Sir Robert as premier. He owed his selection to his skill as a debater, and to his following among the Conservatives of the western provinces. Defeated in 1921, he resigned, but was again premier, July-Sept., 1926. Later he held the position of leader of the government in the senate and was leader of the Conservative party during 1941-42.

Meiktila. District and town of Burma. The district occupies the depression E. of the Pegu Mts. and S. of Mandalay div. It is part of the comparatively dry area of Central Burma, with an annual rainfall of 38 ins. It is crossed by the rly. from Rangoon to Mandalay; rice and oil seeds are the principal crops. The town, about 80 m. S. of Mandalay, is on the road and rly. S.E. from Myingyan on the Irawadi. The Meiktila lake, an old Burmese work, covers 4 sq. m. and is divided by the rly. into N. and S. lake. It irrigates 40,000 acres. Area, dist., 2,183 sq. m. Pop., dist., 344,025; town, 8,700.

Meiktila was occupied by Japanese troops in April, 1942. The town was retaken Feb. 28, 1945, in a surprise dash eastwards across the Irawadi by the 17th Indian div.; the main Meiktila airfield was secured at the end of March.

Meilhac, HENRI (1831-97). French dramatist. He was born in Paris, Feb. 21, 1831, and during

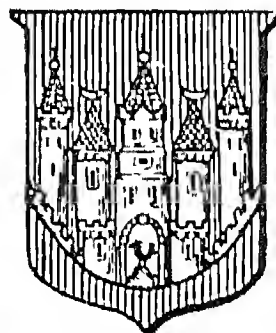


Henri Meilhac,
French dramatist

1861-81 collaborated with Ludovic Halévy in nearly 50 plays, including many librettos for Offenbach's operas (e.g. *La Belle Hélène*). Afterwards, in association

with other writers, he produced some 25 more pieces, of which *Frou-Frou* and *La Grande Duchesse* are specially notable. He died in Paris, July 6, 1897.

Meiningen. Town of E. Germany, in the former *Land* of Thuringia, capital of the duchy of Saxe-Meiningen, 1680-1918. It is on the river Merra 43 m. by rly. N.W. of Coburg. It won international fame under Duke George II who, late in the 19th century, trained and directed a group of actors which took a prominent part in the development of the German theatre; and a theatrical school long remained one of the town's main features. Other notable buildings include the Elisabethenburg palace, 1682, which contains great collections of works of art, coins, etc.; remnants of a monastery of 1239; libraries, museums, and schools. As a town it dates back to the year 982. Pop. (est.) 20,000.



Meiningen arms

Mein Kampf (Ger., *My Struggle*). Book by Adolf Hitler, in which he laid down the principles of National Socialism. He began it, with the help of Rudolph Hess, in April, 1924, while imprisoned in the fortress of Landsberg-am-Lech for his part in the Munich *putsch*. After his release he wrote the second vol., the whole work covering some thousand pages. It describes accurately the *Weltanschauung* of Nazism, with its emotional-ethical-intellectual basis and outlines the methods by which the Nazis would seize power in Germany and the way in which they would use that power at home and abroad, including their plans for foreign conquests. The style is turgid and rhetorical, but its influence was tremendous. It became a sort of bible of National Socialism, and millions of copies were sold; after Hitler's advent to power, a copy was presented to every bridal couple. It was said that the royalties from its sale were the sole source of Hitler's income. The first English trans. of the full text was published 1939, though abridged editions appeared earlier.

Meiosis (Gr., reduction). In literary composition, a figure of speech which underestimates or belittles. Frequently this intends, and produces, humorous effect. Litotes has a similar meaning.

Meiosis (Gr., reduction). The occurrence of two divisions of a reproductive cell accompanied by only one reduplication of its chromosomes. This leads to a reduction of the number of chromosomes in the cell by half. Whereas in mitosis (*q.v.*) the chromosomes reduplicate before the cell division, which distributes one set to each daughter cell, in meiosis cell division takes place once during the reduplication and again at its completion. Chromosomes (*q.v.*) acquire the capacity to take up certain stains during cell division. At this time the genes in the chromosomes appear to attract each other in a very particular way. Each gene attracts, and attracts only, its homologue on that similar chromosome which was derived from the animal's other parent. In mitosis this does not happen because the attraction is, as it were, "used up" in the apposition of replicas to each other. In meiosis, as there are no replicas to begin with, the members of the two sets of chromosomes become attached to each other along their lengths. While they are so associated they reduplicate.

Chromosomes appear to have an essentially spiral internal structure. While the two members of an homologous pair are attached side by side in meiosis they lose some of their internal spiralisations and this leads to their becoming relationally coiled round each other. This can be very clearly shown by taking two pieces of knitting wool and increasing their internal spiralisations by twisting each more tightly than it was twisted when first picked up. If these two pieces of wool are now firmly held touching along their length and then allowed to untwist internally by letting go of one end of the pair they will in fact coil relationally around each other.

The reduplication of the chromosomes, which takes place when they are relationally coiled, is itself spiral so that the two replicas are relationally coiled round each other as well. When the replication is complete the attraction of gene for gene is used up in the attraction of replica for replica, so that the original homologous whole, now double, chromosomes are no longer held together by anything except their relational coiling. This relational coiling is undone by force—by the force that separates the centromeres which, in each chromosome, be-

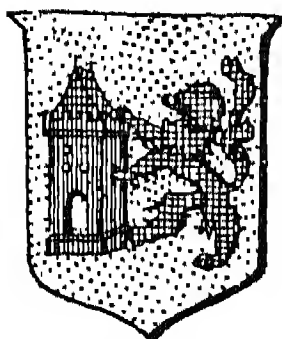
come attached to the spindle (see lower illustration under Cytology, page 2535).

This forcible separation of the homologous chromosomes, each consisting of a couple of replicas, when relationally coiled leads to breakages, the physical basis of crossing over (*q.v.*), and the formation of chiasmata, X-shaped figures. After the homologous chromosomes, whole, or broken as to one of their moieties and repaired by a bit of a moiety of a homologue, have been separated by the completion of the first division of meiosis, a second division separates the whole or broken and repaired replicas, often called chromatids. After this second division each of the four resulting cells has one whole or broken and repaired chromatid of each possible kind present in the species, instead of two chromosomes of each kind present in the species. Meiosis has therefore taken place.

Meir. Site of sculptured rock-tombs in Egypt, in the desert cliff to the N.W. of Assiut. The tombs, which have been ascribed to the period of the Old and Middle Kingdom, contain some unusual examples of mural art and are of interest for the study of the religion of ancient Egypt. *Consult* The Rock Tombs of Meir, A. M. Blackman, 1915-52.

Meiringen. Village of Switzerland, in Berne canton, 7½ m. S.E. of Brienz. It is a popular tourist centre, close to the Reichenbach Fall and the gorges of the Aar and the Alphach. It is noted for its wood-carving.

Meissen. Town of E. Germany. It stands on the left bank of the Elbe, 15 m. N.W. of Dresden, and possesses the huge Albrechtsburg castle, 1471-85, and a fine Gothic cathedral, 13th-14th cent., renovated 1912, as well as other buildings going back to the



Meissen arms

10th century when the "burgraves of Misnia" were set up against Slavonic neighbours. Meissen is a romantic town in a beautiful hilly setting. It was the seat of a R.C. bishopric 968-1581. The churches of S. Afra, 1208, Our Lady, 15th century, S. Francis, 1266, and S. Nicholas, 1390, the 15th-century town hall and the 16th-century pharmacy are other remains of its old glory. Its world fame derives from its china (see

Dresden China), made to the formula of Johan Friedrich Böttger (1682-1719). The china, made for Augustus the Strong, was produced here in the Albrechtsburg. Other industries concern textiles, furniture, machinery, stoves, and chemical products. Pop. (est.) 48,000.

In 1945 Meissen came under Russian occupation, and its industries suffered heavy losses by extensive dismantling and transfer to Russia.

Meissonier, JEAN LOUIS ERNEST (1815-91). French painter. Born at Lyons, Feb. 21, 1815, he be-



J. L. E. Meissonier, French painter

came a pupil of Julien Pothier and Léon Cogniet. Influenced by the 17th-century Dutch painters, he excelled in dramatic and costume works. His first important painting was *The Little Messenger*, 1836. In 1855 his picture *La Rixe* won him fame. Others of his pictures are *The Cavalry Charge*, *The Amused Cavalier*, *Soldiers Gambling*, and *Cuirassiers*. He also painted a few portraits. The Wallace Collection has a good many examples of his work, e.g. *A Sentinel: time of Louis XIII*, 1851; *The Guard Room*, 1857; *The Lost Game*, 1858; *Napoleon I and his Staff*, 1868. He died in Paris, Jan. 31, 1891.

Meistersinger OR MASTER-SINGERS. Members of guilds of musicians and poets, founded in Germany from the 14th to 16th centuries. The earlier Minnesingers were connected with the courts, but on the decline of feudalism the cultivation of the art of singing passed down to the burgher class. Heinrich von Meissen, called *Frauenlob*, one of the last of the Minnesinger, seems to have been a connecting link between

the two kinds of guild, for he was the founder of the first company of Meistersinger at Mainz in 1311. Tyll Eulenspiegel, Brandt, and Hans Sachs were among the most distinguished of later followers of the cult. At Ulm the Meistersinger survived till 1839.

Wagner revived popular interest in the Meistersinger, and immortalised Hans Sachs in his opera *Die Meistersinger von Nürnberg*, 1867, which was first performed in Munich, 1868. In this he faithfully mirrors the degeneracy due to rules which were intended to safeguard the purity of the arts of lyrical poetry and music, but which had become outworn. The most famous aria in the opera is the *Prize Song* (tenor).

Mejillones. Seaport of Chile, in the prov. of Antofagasta. It is 38 m. N. of Antofagasta, with which it is connected by rly. It has a good harbour protected by hills, and is a port for Bolivian tin, etc. Near by there are large guano deposits. It is the terminus of a rly. to Bolivia, to which it belonged up to 1882. Pop. (est.) 3,000.

Meker Burner. A type of gas burner similar to the famous Bunsen burner, but said to give rather more heat. It has numerous applications in the chemical laboratory. The Meker burner is named after its inventor.

Meklong. Seaport of Siam. At the mouth of the river of the same name, it is 45 m. S.W. of Bangkok. The river drains the S.W. of Siam and enters the sea at the W. end of the Menam delta in the Gulf of Siam. The town has a large export trade in salt. Pop. (est.) 16,000.

Meknes. Another spelling of Mequines (*q.v.*), name of a city of Morocco.

Mekong. River of S.E. Asia. It rises in the Tibetan plateau, and flows S. through China and Indo-China. In its upper reaches it flows with torrential speed through deep, rocky gorges. It forms for part of its course the boundary



Meissen, Saxony. View across the Elbe, showing the old town and bridge with Albrechtsburg castle and the cathedral on the right

between Siam and Indo-China, and empties itself in the China Sea. Total length, 2,800 m.

Mekran. See Makran.

Melamine Plastics. Type of synthetic material. Discovered in 1856 by the German chemist Justus von Liebig (1803-1873), melamine belongs to the urea family, and reacts with formaldehyde to produce a soluble and fusible resin which is water-clear and colourless, hygroscopic, and miscible with water and water-alcohol mixtures. Under the application of controlled heat these resins are cured *i.e.* converted to the infusible and insoluble stage; by contrast with what happens to others of the thermo-hardening class, this change takes place over a wide range of acidity and basicity. The unconverted resins react with alcohols to yield resins which are soluble in a number of organic solvents. The outstanding characteristic of melamine plastics in comparison with other aminoplastics is their greater resistance to water and to heat. This resulted in their increased use during and after the Second Great War both as compression-moulded units and also as laminates. Articles can also be moulded in melamine by extrusion, casting, injection, or jet, according to the shape and size of the intended product.

In combination with alpha cellulose fillers, melamine resins provide moulding compositions in pearl and a range of bright and stable colours. This has found application in the production of moulded tableware for uses in which resistance to scratch and stain is desirable. Melamine laminates are used for resistant table tops, nameplates, and translucent panels. Melamine resins have also been applied as hot-set waterproof "glues" for ply and laminated wood, giving products of remarkable glue-line strength in tension and shear, with good resistance to water and fungi. The addition of melamine has also imparted resistance to boiling water to urea resin bonding compositions.

The hydrophobic properties of melamine resins have been used in the production of paper to make it retain strength when wet. Approximately 3 p.c. of a melamine resin acid colloid is incorporated in paper at the beater stage to yield a paper which is over 60 p.c. as strong when wet as when dry. Paper so treated has been used for maps, towelling, blueprints, currency, and heavy duty packaging, as well as for

other applications for which paper had previously not been used.

Melamine resins were produced in the U.K. before and during the Second Great War, but shortage of raw material restricted large-scale production in the U.K. until 1951.

Melampus. In Greek legend, the first prophet and physician among mankind. As he lay sleeping, two serpents he had reared licked his ears, thus enabling him to interpret the language of beasts and birds. Having been cast into prison, he learned from the woodworms that the prison would soon fall, and having told this to Iphicles, the king who had imprisoned him, he received from him many favours. He rendered Iphicles other services by means of his supernatural gifts, and eventually became king of a third of Argos. Melampus learnt the art of medicine from Apollo.

Melancholia (Gr. *melas*, black; *chole*, bile). Form of mental illness characterised by severe depression. The cause is unknown, but melancholia is believed to be of a somewhat similar nature to the depression occurring in cyclothymia (recurrent manic-depressive insanity): that is to say, it is not related to outside circumstances but to unknown physical or psychological factors affecting the individual patient. The Greek physician Hippocrates believed that depression was due to an excess of black bile in the system; this theory is no longer accepted.

Melancholia is of most common occurrence in patients in the late fifties or sixties. Heredity, once thought to be an important predisposing cause, appears to play little part in its incidence. Symptoms vary, but they often include delusions of worthlessness, persecution, extreme poverty, or disturbance of one of the bodily functions, especially the excretory functions. The patient may be apathetic and completely out of touch with life or even stuporous. There is considerable risk of suicide by persons with severe melancholia.

The manifestations of melancholia differ in different individuals. The patient may be markedly depressed, lethargic in his movements, and sit listlessly, speaking slowly or weeping and bemoaning his fate. Delusions are common and often of a religious character, the patient, for example, believing that he has committed the unpardonable sin and is actually in hell; others believe that they have lost important bodily organs

and will state that they have no brain or bowels. Sometimes the delusions are of a sexual nature.

Another patient may sometimes be restless and agitated, at others he may sit motionless for hours together, apparently oblivious of his surroundings, but if left alone he may seize the opportunity of committing suicide. The patient may refuse food to such an extent that artificial feeding may have to be resorted to.

Each case must be considered on its own merits as regards management. Treatment includes general hygienic measures, fresh air, exercise, and rest. Hypnotics must be given to combat insomnia and restlessness. In some types of melancholia dramatic improvement has followed the use of convulsant electric therapy, in which a strong electric current is passed through the brain, probably upon several occasions.

The delicate operation of prefrontal leucotomy, in which a knife is inserted through a point in the skull, and the fibres between the front and hind brain are disconnected, has been occasionally used in the treatment of melancholia. It banishes the melancholia, but it has other and irremediable effects on the patient's character and behaviour which are of doubtful beneficence.

Melanchthon, PHILIP (1497-1560). German reformer. His name was Schwarzert, *i.e.* black earth, which was rendered into Greek as Melanchthon. He was born at Bretten, in the Palatinate, Feb. 16, 1497, and educated at Heidelberg and Tübingen. In 1518 he was appointed professor of Greek at Wittenberg, where, coming under Luther's influence, he became a Protestant. Three years later he published his *Commonplaces of Theological Matters*.

The Augsburg Confession was drawn up by him in 1530, and he became recognized as the leading scholar of the German Reformation. He took part in the conferences of Worms and Ratisbon, and proved himself a formidable opponent to the R.C. representatives. On the death of Luther, he became the dominant spirit in the movement. A great humanist and a man of serene and conciliatory temper, he did much to moderate the violence of the extreme partisans. He was the author of many books, including theological and controversial treatises, commentaries on the classical authors, and works on history and philosophy. See Luther; Reformation; Re-

naissance; consult Works, ed. Bretschneider and Bindsell, in Corpus Reformatum, 28 vols., 1834-60; Lives, B. Saunders, 1897; G. Wilson, 1897; M. Alien or Ally, F. Hildebrandt, 1946.

Melanesia (Gr. *melas*, black; *nēsos*, island). Collective name of a number of groups of islands in the Pacific Ocean. They lie between the equator and the Tropic of Capricorn, and between Papua and the Fiji Islands. The chief groups are the Solomon, Admiralty, Loyalty, Bismarck, Santa Cruz, New Hebrides, etc. They were politically apportioned among Great Britain, France, and Ger-

become more frequent since the middle of the 19th century, in association with industrialisation. According to Ford, industrial melanism, as this phenomenon is called, depends on hereditary factors each exhibiting complete or partial dominance. Black areas of black and white guinea-pigs are due to the presence of melanin granules in the epidermis of the black areas, in what may be called dendritic cells. If black skin from a spotted guinea-pig is grafted to a non-pigmented area, the superficial epidermis, but not the hairs, of the white skin becomes black; conversely, white grafts transplanted to black areas become

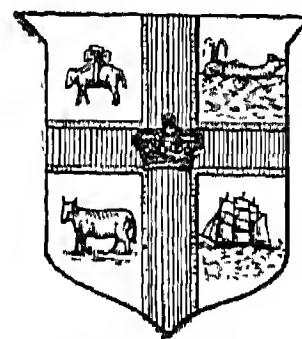
under Marchesi in Paris, and made her first appearance in opera at Brussels, 1887, taking the name of Melba as a tribute to her native city. The following year she made her début at Covent Garden, where she scored an immediate success.

Dame Nellie Melba,
Australian singer
Speaight

A soprano of great sweetness and brilliant execution, her voice had extraordinary flexibility and perfect sense of restraint. She became world-famous, appearing regularly in London, Paris, and New York. In 1894 she created the part of Nedda in *I Pagliacci*, and her most famous operatic characters included Lucia, Gilda, Mimi, and Violetta. After 1902 she made repeated world tours, dividing her interests between England and Australia. Created D.B.E. in 1918, she retired in 1926, and died Feb. 23, 1931. Her reminiscences, *Melodies and Memories* appeared in 1925. Consult biographies by A. Murphy, 1909; P. Colson, 1932.

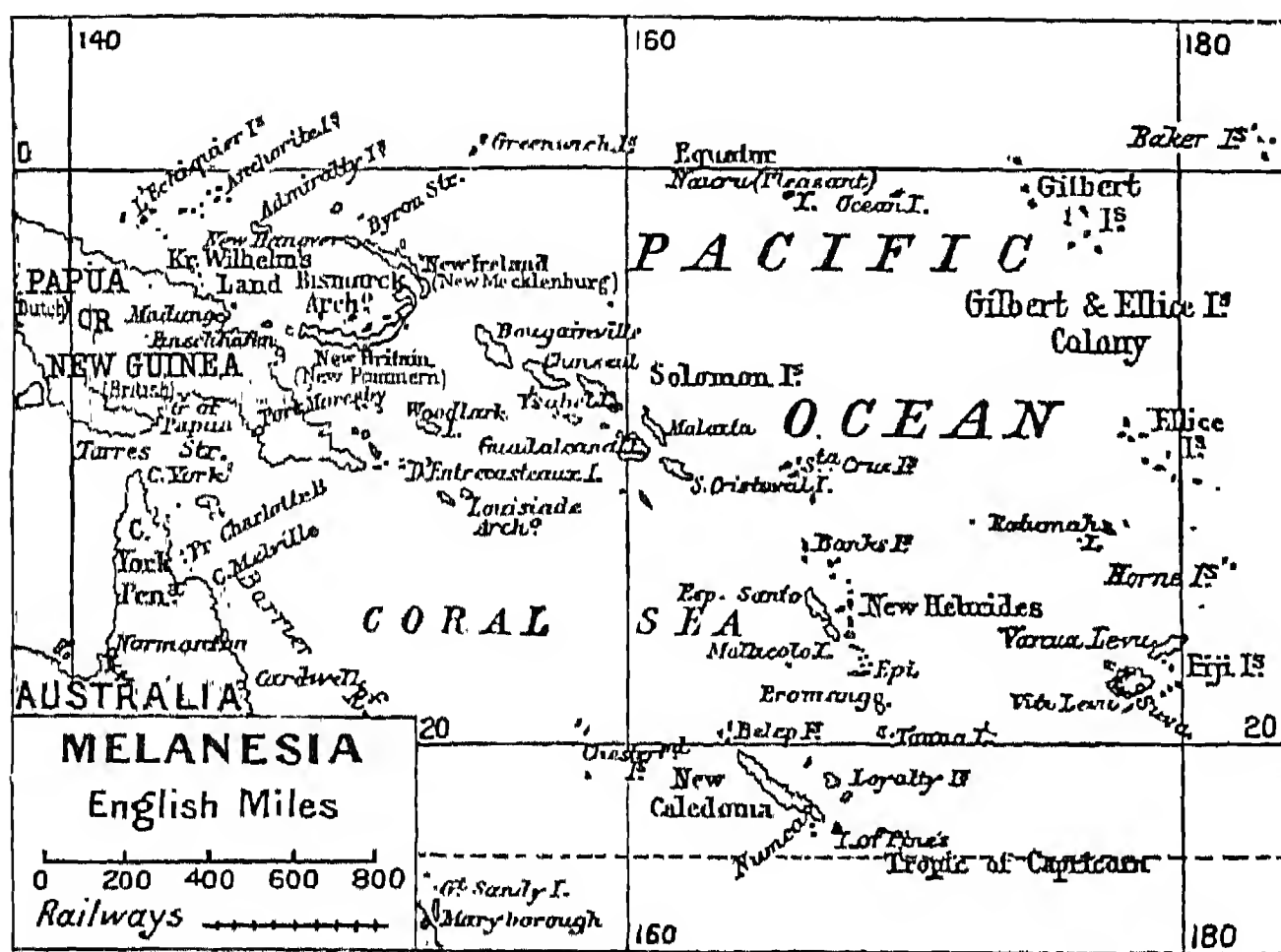
Melbourne. Parish and town, Derbyshire, England, 7 m. S.E. of Derby. It has a Norman church built about 1090. The Dutch gardens of Melbourne Hall were laid out in 1720. Boots and shoes and silk goods are manufactured. It is also noted for its market gardens. Pop. 4,000.

Melbourne. Capital of Victoria, Australia. It is situated at the N. of Port Phillip, in Bourke co., on the banks of the river Yarra, which flows into Hobson's Bay, an inlet of Port Phillip. Hobson's Bay has anchorage for 800 vessels, with a



Melbourne arms

varying depth of from 3 to 5 fathoms, while three-fourths of the 800 sq. m. of Port Phillip Bay are similarly available. The Yarra, a stream 100 m. long, is navigable to the heart of the city for vessels of 22 ft. draught, and is tidal to Richmond, the Coode canal shortening the distance from its mouth to the city by more than 1 m. Port Melbourne, formerly Sandridge, is 2½ m. S.W. of the city by road, and has steamboat and rly. connexion with Williamstown, at the opposite side of Hobson's Bay.



Melanesia. Map of the Eastern Pacific, showing the principal groups of islands

many, but the German possessions were captured in the First Great War, and are now administered by Australia and New Zealand.

Melanesian. Term denoting the dominant ethnic stock in Melanesia whose members are of medium to tall stature, chocolate to copper-coloured, often wavy-haired, and usually long-headed. An aboriginal black woolly-haired population has been influenced, to varying extent according to locality, by immigrants from Indonesia and Polynesia. Fishing and agriculture are practised.

Melanins. Chemical term applied to the pigments of the body, usually found in the epidermal organs, such as hair.

Melanism. Term used in zoology to describe the presence of black coloration in animals normally of a lighter colour. This phenomenon occurs in moths, e.g. *Boarmia*, and among many species there can be no doubt that it has

progressively pigmented. This process of infective melanin spread does not entail the wholesale replacement of the tissues, for a claw from the white area grafted to a black portion of the sole of the foot changes colour without any loss of form.

Melaphyre. In geology, a general term for altered basic lavas such as basalts. Melaphyres are soft rocks, decomposed by the passage of steam or hot water. In colour they are usually reddish or green.

Melba, DAME NELLIE (1859-1931). Australian singer. Born Helen Porter Mitchell, she was the daughter of a building contractor, and was born at Burnley, Melbourne, Australia, May 19, 1859. She sang as a child in Melbourne, but owing to parental opposition it was not until after her marriage to Charles Armstrong in 1882 that she became a professional singer. She studied



Melbourne, Australia. Map of the environs of the city, showing also Geelong harbour and the bay of Port Phillip

The city proper covers an area of about 8,000 acres, and there are extensive suburbs, some of which have city rank. The principal streets in the city, named after Australian notabilities, are 1 m. long and 99 ft. wide, and run at right angles to each other. The public buildings, among the finest of any city of equal size in the world, include the houses of par-

liament, built 1855-91, which, pending the building of Canberra (q.v.), housed the parliament of the Commonwealth: Exhibition Building, 1881; Trades Hall; and town hall, with an assembly hall holding 2,500 people and a magnificent organ.

Other buildings include the G.P.O., custom house, mint, 1872; public library, with over 300,000

volumes; national art gallery, technological museum, law courts, treasury, university, hospitals, observatory, etc. The banks, stores, and other business premises are on a handsome scale, and there are several markets. The ecclesiastical buildings include S. Patrick's Cathedral, R.C., the Anglican cathedral of S. Paul, the Scots, Independent, and a number of other churches. There are theatres, an opera house, music and con-

cert halls, zoological and botanical gardens, and parks.

Rly. and air facilities afford communication with all the other state capitals, and electric suburban services are supplemented by electric tramways. The holiday resorts include South Melbourne, St. Kilda, Brighton, Sandringham, Beaumaris, Mentone, Aspendale, and Heidelberg. The racecourses include Flemington, where the Melbourne Cup race is run. A great annual aquatic festival is held at Henley-on-Yarra.

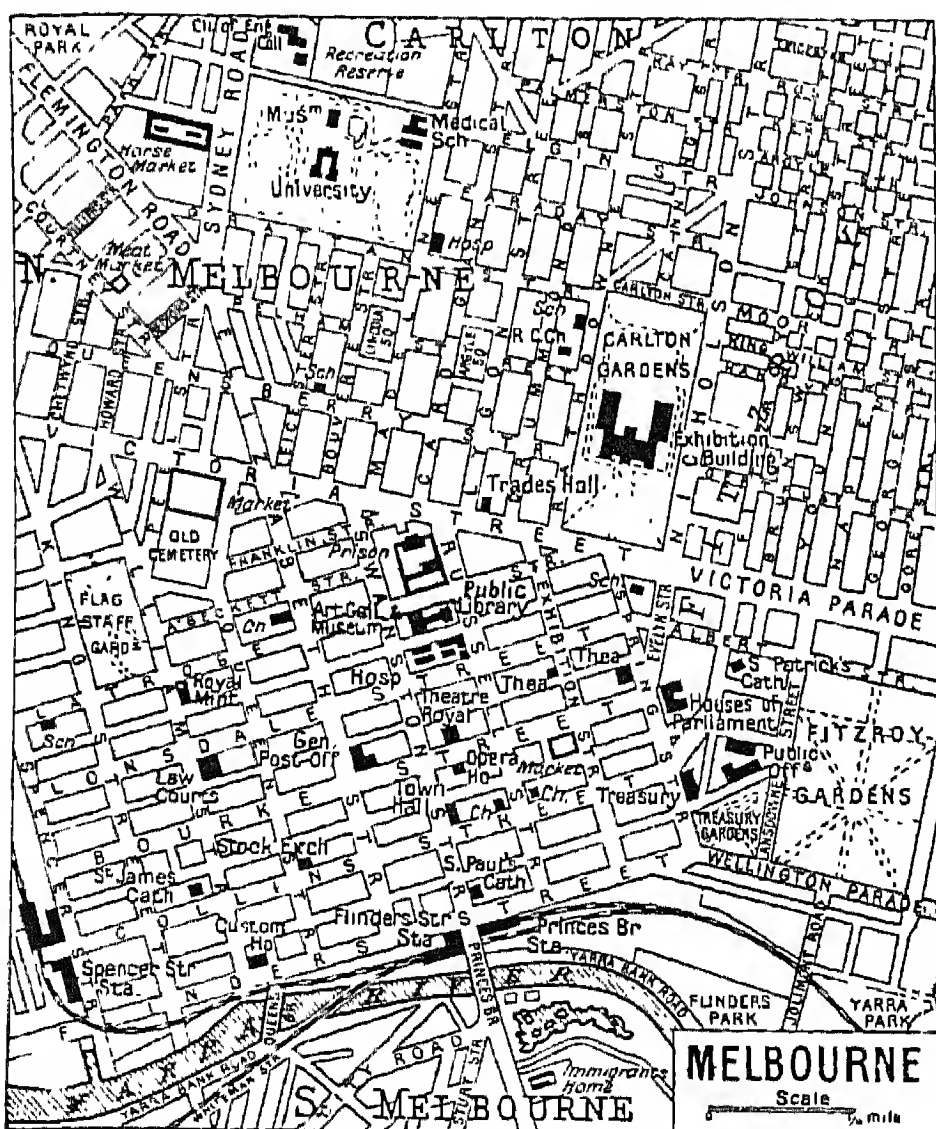
Apart from the shipping, there are foundries, flour and woollen mills, boot and clothing factories, potteries, soap works, tan yards, and wool-washing works; and gold, meat, wool, fruit, etc., are exported. Except for periodical hot N. winds, the climate is fine; mean temperature, 58.3; average rainfall, 25.62 ins. A metropolitan board of works was established in 1891. Three systems of water-supply provide 90,000,000 galls. daily.

First occupied by whites in 1835, Melbourne was in 1837 named after Lord Melbourne at the suggestion of Sir Richard Bourke, governor 1831-37 of New South Wales (which then included what became Victoria). In 1836 it consisted of 13 meagre buildings. By 1841 the population had increased to 11,000. Incorporated Aug. 12, 1842, it was made an episcopal see Aug. 3, 1849. When the goldfields were opened in 1851, and what was then Port Phillip district became the colony of Victoria, Melbourne was made its capital. During 1901-27 it was the seat of the Australian government. Pop. (1954) 1,524,062.

Melbourne, UNIVERSITY OF. Established in 1853 by the Victorian Legislature, it receives an annual subvention from the government. There are faculties of arts, science, law, medicine, dentistry, veterinary science, and of engineering, including mining and agriculture.

Affiliated colleges are four residential colleges controlled by representatives of the churches and the Australian college of dentistry.

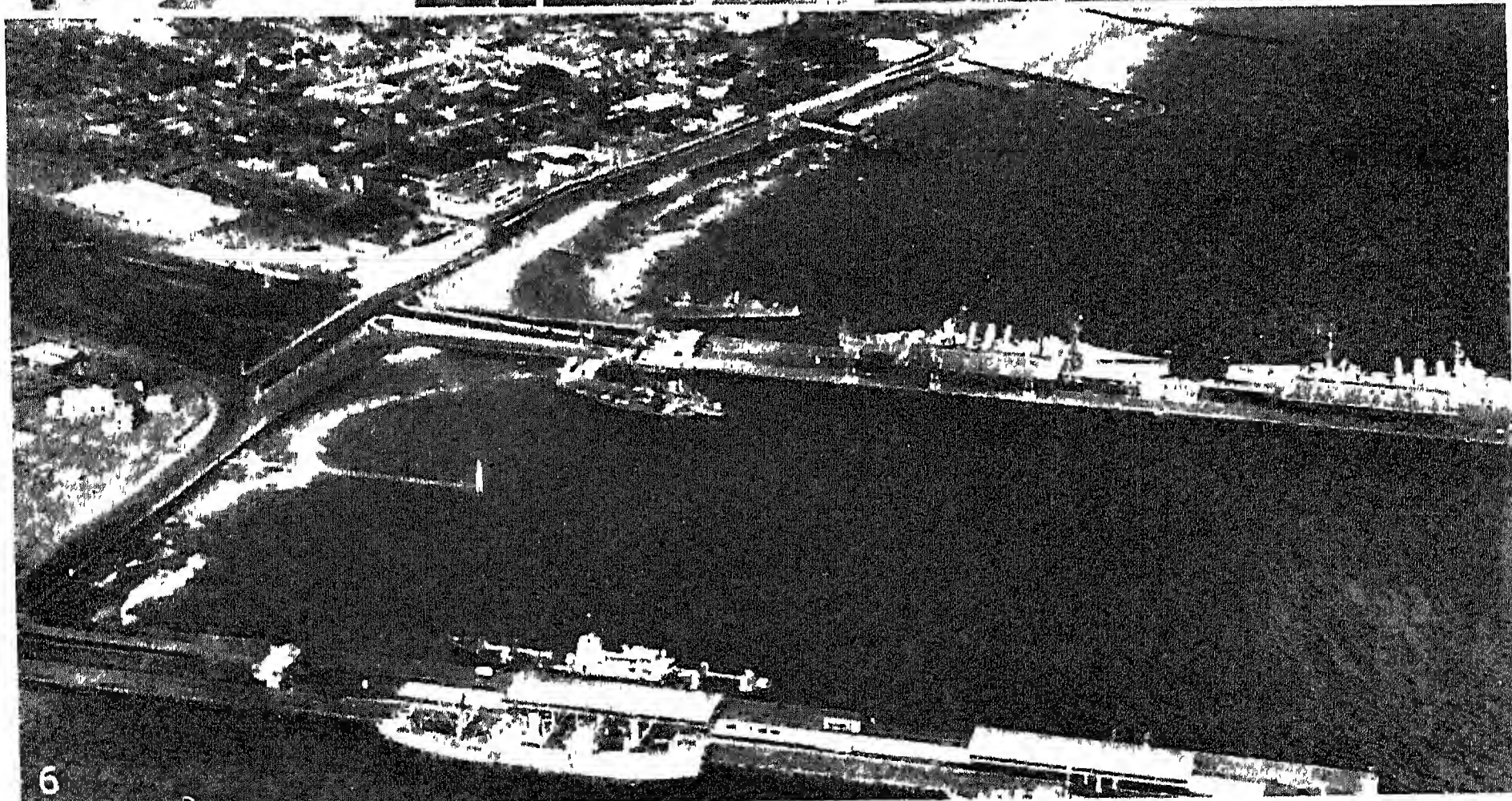
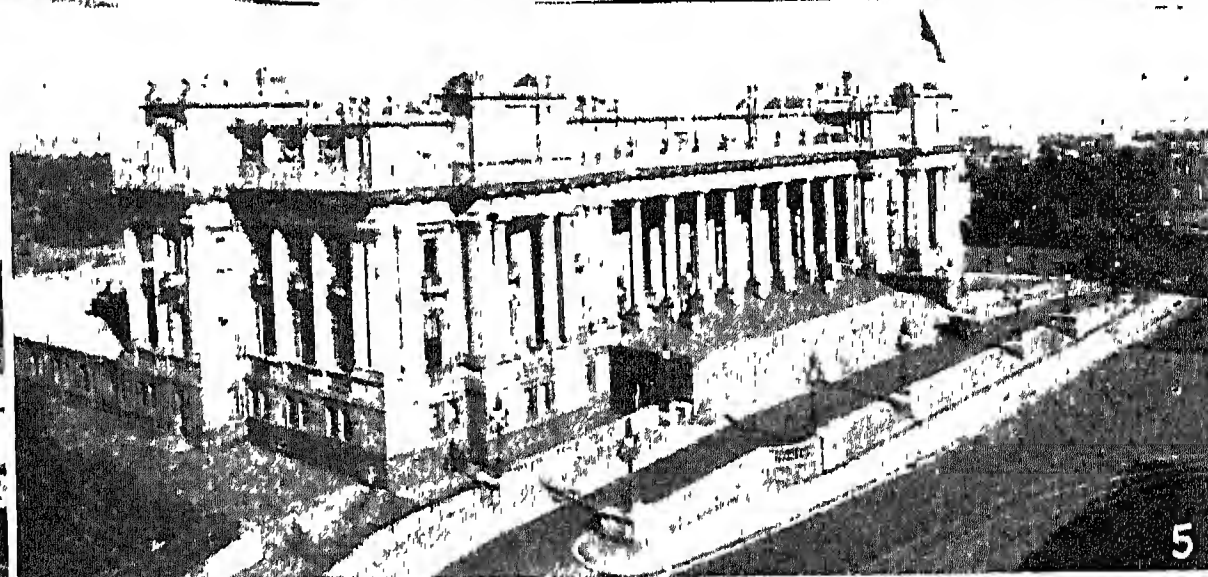
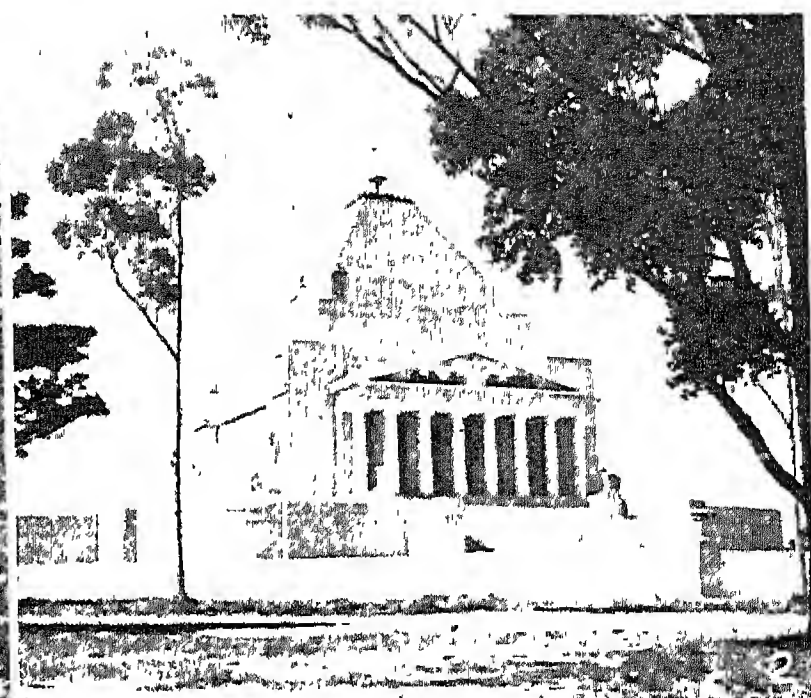
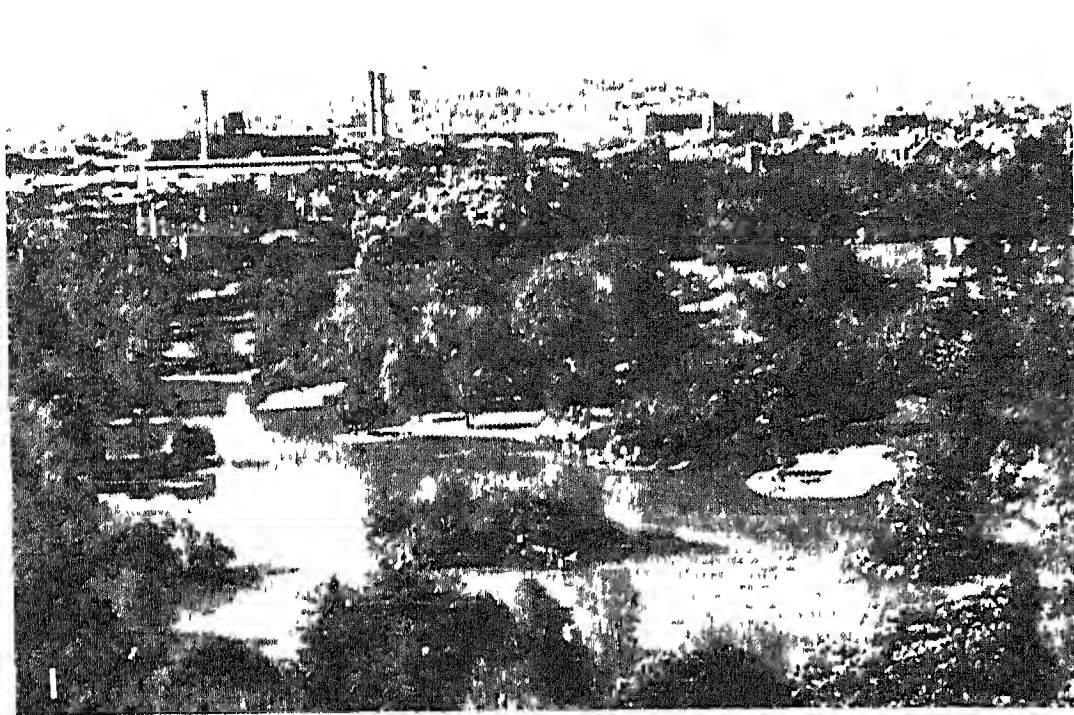
Melbourne, WILLIAM LAMB, 2ND VISCOUNT (1779-1848). British politician. A son of Peniston Lamb, created Viscount Melbourne in 1781, he was born March 15, 1779. Educated at Eton and Trinity College, Cambridge, he be-



Melbourne, Australia. Plan of the city proper



Melbourne University arms



1. The Botanic Gardens, from the air, showing the main lake, with factory and residential suburbs beyond. 2. The Shrine of Remembrance, Melbourne's 1914-18 war memorial in St. Kilda Road. 3. Collins Street, the tree-lined chief thoroughfare of the city. 4. The Public

Library and National Gallery of Art and Industry. 5. Parliament House of the State of Victoria. 6. Station Pier (top) and Princes Pier, Port Melbourne. Each pier is served by eight railway tracks; together they can accommodate eight of the largest vessels

MELBOURNE: NOTABLE FEATURES OF THE CAPITAL CITY OF VICTORIA AUSTRALIA

came a barrister. In 1805 he married Lady Caroline, the eccentric daughter of the earl of Bessborough, but the two soon separated. In 1806 he entered parliament as Whig M.P. for Leominster and represented a succession of constituencies until he succeeded to the peerage in 1829. For a time he supported the Tories, and his official career began when, in 1827, he was chief secretary for Ireland under Canning, but he resigned the following year.

Having rejoined the Whigs, he entered Earl Grey's ministry as home secretary, and four years later succeeded him as prime minister. He resigned a few months later, but again became premier in April, 1835. In 1838 he resigned, but difficulties arose when Peel tried to form a ministry, and at the instance of the queen Melbourne returned. (See Bedchamber Question.) After defeats in the House of Commons, he finally left office in Aug., 1841. He died Nov. 24, 1848. He was a successful politician, although he lacked nearly all the qualities of a statesman, save perhaps tact. He is best known as the guide of the young Queen Victoria. His brother Frederick (1782-1853) succeeded to the title which on his death became extinct. *Consult* *Memoirs*, ed. W. T. MacCullagh Torrens, 2nd ed. 1890; *Lives*, B. Newman, 1930; David Cecil, 1954.

Melbourne Age, THE. Morning newspaper published in Melbourne, Victoria, Australia, founded in 1854. An illustrated weekly, *The Leader*, intended mainly for the farming community, is issued from the same office.

Melbourne Argus. Morning newspaper long published in Melbourne, Victoria, Australia. It was established in 1846. In 1949 it passed under the control of Daily Mirror Newspapers, Ltd., London, and ceased publication Jan. 19, 1957.

Melchett, ALFRED MORITZ MOND, 1ST BARON (1868-1930). British industrialist and politician. He was born at Farnworth, Lancs, Oct. 23, 1868, a son of Ludwig Mond, the scientist, and educated at Cheltenham College; S. John's College, Cambridge; and Edin-

burgh university. Mond entered the firm of Brunner, Mond and Co., and was called to the bar in 1894. Liberal M.P. for Chester (1906) and Swansea (1910), he joined the coalition government in 1916 as first commissioner of works. Mond was minister of Health 1921-22, and in 1924 was elected M.P. for Carmarthen, joining the Unionist party in 1926. He was responsible for the formation of the great combine, Imperial Chemical Industries (*q.v.*). In 1910 Mond was made a baronet and in 1928 a baron. He died Dec. 27, 1930. His son Henry (1898-1949) succeeded as 2nd baron. He was educated at Winchester, was Lib-



Lord Melchett,
British politician
Russell

an ardent supporter of Zionism.

Melchior. One of the Three Kings (*q.v.*).

Melchites. Word meaning followers of the king, *i.e.* the East Roman emperor, adopted in the 5th century as a name for the Orthodox Egyptian Christians to distinguish them from the Jacobites (*q.v.*), who supported the Monophysite heresy. They are now in union with the Church of Rome, but retain many of their traditional usages.

Melchizedek. A priest-king of Salem. He is described as Priest of the Most High God, and Abraham received his blessing and paid him tithes after one of his victories (Gen. 14). Salem was probably Jerusalem, and the Tell-el-Amarna tablets mention a priest-king of the place, appointed neither by his father nor his mother, who is styled Servant of the Good One. As a priest-king with high prerogatives, Melchizedek is mystically regarded in Ps. 110 and Heb. 5 and 7 as a type of the Messiah.

Melcombe, GEORGE BUBB DODDINGTON, BARON (1691-1762). English politician. The son of Jeremias Bubb, he took the additional name of Doddington on succeeding to the estate of his maternal uncle. In 1715 he was M.P. for Winchelsea. From 1722-54 he represented Bridgwater. He was a lord of the treasury, 1724-40, and afterwards was twice treasurer of the navy.

In 1761 he was made a baron, and he died July 28, 1762. He was a member of the Hell Fire Club. His *Diary* was published in 1784. *See* *Medmenham*.



Lord Melcombe,
English politician

Melcombe Regis. Parish of Dorset, England, within the borough of Weymouth and Melcombe Regis. The first victims of the Black Death in England died here in Aug., 1348. *See* *Weymouth*.

Meldola, RAPHAEL (1849-1915). British chemist. Born in London and educated at the Royal School of Mines, he afterwards became assistant to Sir Edward Frankland at the Royal College of Science, and to Sir Norman Lockyer at the Solar Physics Laboratory. From 1876-85 he was chemist to a firm of aniline dye makers, and then was appointed professor of chemistry at the Finsbury Technical College, a position he held at the time of his death. Meldola discovered several important aniline colours, as naphthol blue (Meldola's blue), alkali blue, and viridine. He first prepared the photographic developer eikonogen. Two of his best known books are *Chemical Synthesis of Vital Products*, 1904; and *The Chemistry of Photography*, 1889. He died Nov. 16, 1915.

Meldrum, OLD. Burgh of Scotland. In Aberdeenshire, it is 16 m. N.W. of Aberdeen and has been a burgh since 1672. Cotton goods are manufactured here. About $\frac{1}{2}$ m. to the S. lies Barra Hill, with a prehistoric fort, said to be the site of the battle between Robert Bruce and Comyn, Earl of Buchan, in 1308. Pop. (1951) 1,103.

Meleager. In Greek legend, a famous hero and hunter. The Fates having foretold that he should live only as long as a firebrand which was then burning should be unconsumed, his mother, Althaea, put it out, and locked it up in a chest. When Meleager grew up to manhood, the goddess Artemis offended by his father Oeneus, sent a monstrous boar to ravage the land of Aetolia. All the heroes were invited to assist in the killing of the boar, and among them came the famous huntress Atalanta. The boar was finally killed by Meleager, who gave the skin and head to Atalanta, as she had given the animal the first wound. This compliment gave offence to the other

hunters, and two brothers of Althaea endeavoured to take the trophies from Atalanta, but were killed by Meleager. Althaea threw the brand into the fire, and Meleager immediately died.

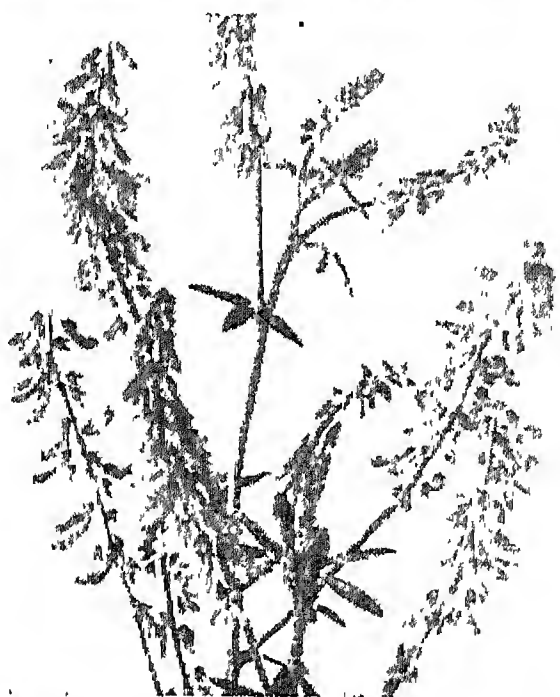
Meleda (Yug. Mljet). Italian name of a Yugoslav island in the Adriatic Sea, off the Dalmatian coast; its most easterly point is 19 m. W. of Dubrovnik (Ragusa). It is 22 m. long and less than 3 m. wide.

Melfi. City of Italy, in the prov. of Potenza. It stands on the slopes of the volcanic peak of Monte Vulture, at an alt. of 1,590 ft., and has a splendid view of the plain of Capitanata. Its old castle, founded by Robert Guiscard, was restored by the Dorias. The cathedral, consecrated in 1155, was rebuilt after the earthquake of 1851 which destroyed most of the town. Melfi trades in cereals, olive oil, and wine. The capital of Apulia under the Normans, it has a long history of rebellions, massacres, sieges, captures, and spoliation. It suffered no damage during the Second Great War, being overrun in Sept., 1943, by Canadians advancing against little opposition. Pop. (1951) 17,315.

Meli, GIOVANNI (1740–1815). Sicilian poet. He was born March 4, 1740, at Palermo, educated for the medical profession, and became professor of chemistry at Palermo University in 1787, dying Dec. 10, 1815. He wrote many eclogues, odes, and epigrams, chiefly in the Sicilian dialect, and a number of fables that found popular favour. A complete edition of his poems was published in 1814, and a later one, including an ode to Lord Nelson, in 1830. An edition, revised by A. Alfano, was published in 1908.

Melilite. A complex calcium aluminium magnesium silicate occurring in basic lavas low in silica and without feldspar. It is commonly found in slags.

Melilla. Harbour of Morocco. On the N.E. coast, formerly within the Spanish zone, it is the main port of entry into the Rif country. It lies on the E. side of the mountainous promontory of Tres Forcas. Extensive harbour works were carried out by the Spanish, and narrow-gauge railways were built through Nador to Seluan (Zeluan) and Tafersit, and to the lead mines at Afra Minas, as well as to the iron ore mines in the E. region. Melilla was acquired by Spain in 1496. Fighting took place in the Melilla zone in July, 1921, the tribesmen inflicting a serious



Melilot. Leaves and flower-heads

defeat on the Spanish troops. Pop. (1955) 85,010.

Melilot (*Melilotus officinalis* and *M. alba*). Herbs of the family Leguminosae, native to Europe and Asia. The leaves are divided into three narrow, oblong, toothed leaflets. The flowers in appearance are like those of furze, but only a quarter of an inch long, drooping, in an erect one-sided spray; those of *M. officinalis* are deep-yellow, and of *M. alba* white. When dry the plants give off the odour of new-mown hay.

Méline, FÉLIX JULES (1838–1925). French politician. Born at Remiremont, Vosges, May 20, 1838, he was deputy for the Vosges 1872–1903. Keenly interested in the increase of agricultural production, he founded the order of merit of agriculture, was president of the chamber 1888–89, and prime minister 1896–98. The fall of his ministry was caused partly by the Dreyfus agitation. Elected senator 1903, he died Dec. 21, 1925.

Melinite. Another name, commonly used in France, for trinitrophenol.

Melitopol. Town of Zaporozhe region, Ukraine S.S.R., 70 m. S. of Zaporozhe town. An agricultural centre in a district where fruit is the main crop, it also has machine shops, chemical and furniture factories, flour mills, cottonseed-oil presses, etc. Pop. (est.) 75,000.

The Germans captured it in Oct., 1941, and made it one of their chief strong points E. of the Dnieper. It was recaptured by the Russians Oct. 23, 1943, only after 11 days of bitter house-to-house fighting.

Melkart (king of the city). Phoenician deity. He was especially worshipped in Tyre, where Hiram, about 950 B.C., erected the great temple mentioned by Herodotus. The twin pillars facing its portal, long since destroyed, were imitated in Solomon's temple at Jerusalem. The name of the temple, "Pillars of Hercules," in Tyre, became applied perhaps symbolically to the rocks flanking the Strait of Gibraltar. Identified with Heracles, Melkart — whose name in Greek was Melicertes — was in part a sun-god, in part the patron of mariners. Jezebel, Ahab's Tyrian consort, introduced into Samaria the Melkart worship, and her daughter Athaliah encouraged it in Jerusalem.

Melksham. Urban district and market town of Wilts, England. It stands on the Avon, 6 m. S. of Chippenham. The chief building is the church, in which a little Norman work remains; it has a fine chapel of somewhat later date. There is a town hall. The industries include heavy engineering and flour milling. The town has saline springs. Market day, Tues. Pop. (1951) 6,739.

Melle. Town of France, in the department of Deux-Sèvres, 17 m. E.S.E. of Niort, capital of the department. The church of S. Hilaire, one of two 12th-century churches, has remarkable sculptures. The Romans worked a silver-lead mine here. Pop. (1954) 3,221.

Mellifont. Village of co. Louth, Irish Republic, on the Mattock, about 5 m. from Drogheda. It is famous for the ruins of its Cister-



Melksham, Wiltshire. S. Michael's Church, restored 1881

cian abbey, which was founded 1142. The ruins include part of the gateway, baptistery, and chapter house.

Mellitic Acid. A crystalline body first discovered in 1799 by Klaproth in honey-stone, and for a long time called honey-stone acid. Mellitic acid is prepared by boiling honey-stone with ammonium car-

bonate to form ammonium mellitate, adding lead acetate, and decomposing the lead mellitate by means of sulphuretted hydrogen.

Mellitus (d. 624). Archbishop of Canterbury. Sent to England as a missionary by Gregory the Great, he was consecrated by Augustine, and for him King Ethelbert of Kent built S. Paul's church in London, Mellitus being the first bishop of the city. He succeeded Laurentius as primate in 619 and died April 24, 624.

Mellon, Andrew William (1855-1937). American financier and politician. Born in Pittsburgh.



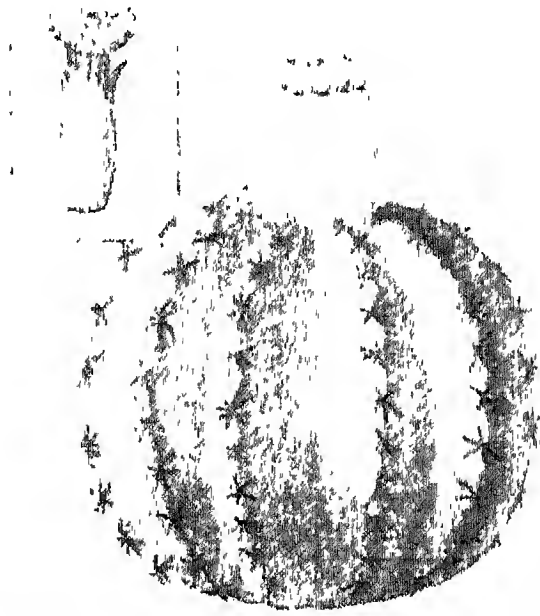
Andrew Mellon,
American politician

Mar. 24, 1855, he graduated from the Western University of Pennsylvania in 1873. He became president of the Mellon National Bank, but resigned in 1921 on his appointment as secretary of the treasury, an office he held until 1932. He played an important part in the international debt settlement after the First Great War, maintaining that, while the Allies should repay the debts incurred to the U.S.A., they should not be pressed beyond their capacity for repayment. In Feb., 1932, he became ambassador in London, but was replaced when Roosevelt became president a year later. A generous patron of music and art, he gave to the American nation a collection of paintings worth £10,000,000, and paid a further £2,000,000 towards a gallery to house them. In 1913 he founded the Mellon Institute of Industrial Research (*q.v.*). He died Aug. 27, 1937, leaving his estate, believed to be worth over £40,000,000, to the Mellon Educational and Charitable Trust.

Mellon Institute. The Mellon Institute of Industrial Research was established in 1913 at the University of Pittsburgh by the late Andrew W. Mellon, to provide qualified workers with facilities for the investigation of problems in pure and applied science. During the Second Great War its activities were largely switched over to researches in scientific questions bearing directly on military operations. According to a report issued after the resumption of normal work, 82 research programmes were in operation, most of them in chemistry, industrial hygiene,

metallurgy, and ceramics. The institute awards annually a number of valuable fellowships to scientists and engineers.

Melocactus (Melon - shaped Cactus). Genus of perennial succulent plants of the family Cactaceae.



Melocactus. Tropical American plant ;
inset, tubular flower

Natives of Mexico, Brazil, and the W. Indies, they have globular, ribbed stems, with a short central cylindrical extension upwards, which is clothed with woolly hairs and soft spines. The ridges of the swollen base bear stouter spines in clusters at regular intervals. The rosy, tubular flowers are produced at the summit of the short column. The Turk's cap (*M. communis*) is the best known species.

Melodrama (Gr. *melos*, song ; *drama*, action). Strictly, a stage play in which appropriate music, vocal and instrumental, is introduced to heighten emotional or dramatic effect. In its original form it is said to have been first perfected in France as a natural and orderly development of opera, differing essentially from that higher form of dramatic art in that the music was accessory to, and the songs were interpolations in, spoken dialogue, whereas in opera the story is told exclusively in recitative and aria. Rousseau's *Pygmalion* (1775) is often named as the first play of the kind.

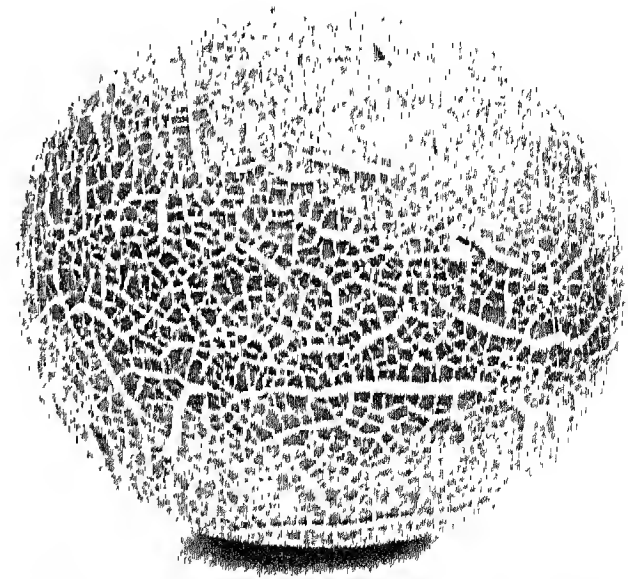
Gradually melodrama developed into a composite of sensational drama derived from tragedy and of domestic drama derived from the comedy of life. Sensational incident and sentimental appeal were variously underlined by snatches of appropriate orchestral music. Its convention requires that virtue shall ultimately triumph over vice. It relies on primitive passions shown in conflict in elemental conditions rather than on subtle analysis of character as developed in the hothouse atmosphere of artificial civilization, and on crude colouring in the presentation of

moral qualities. The figures of melodrama are as conventional as were those of the old morality play, and the *jeune premier* or juvenile lead, the *ingénue* or innocent heroine, the heavy father, the villain, and the rustic clown or other fool who supplied the comic relief, are types as rigid as Vice and the rest. As the conventions of modern melodrama require that the figures shall need no labels round their necks to indicate the qualities they personify, so they require that nothing shall be left to the imagination in respect of the environment in which they are brought into mutual conflict.

Nevertheless, while the melodrama is comparatively easy to ridicule or to burlesque, it is a dramatic form requiring of its author considerable knowledge of human nature and great technical skill in construction. As acclimatised in England it became a notable part of the English drama in the hands of such producers as the brothers Gatti at the Adelphi Theatre, Augustus Harris and Arthur Collins at Drury Lane, and Walter Melville at The Lyceum.

Melon (*Cucumis melo*). Plant of the family Cucurbitaceae. It is a trailing plant, and, a native of Asia, was introduced into Great Britain about 1570. Many varieties and sizes are cultivated, the flesh being sometimes green, sometimes white, and sometimes orange. The water melon (*Citrullus vulgaris*) of the same family, but different genus, is a native of S. and tropical Africa.

The number of fruits on each plant should be limited to two, otherwise the quality and size of the fruit will suffer. Where melons are grown in a frame instead of a house the swelling fruits should have a piece of brick, tile, or other similar material placed underneath them to avoid direct contact with the soil. See Cucumber ; Gourd.



Melon. Fruit of the cultivated variety.
Eminence
J. Wallis, Kew

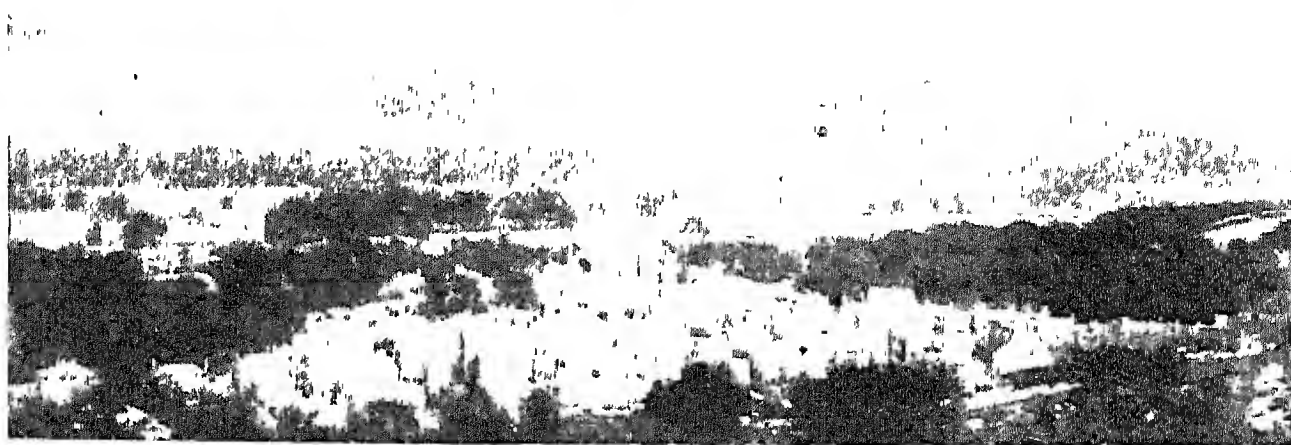
Meloria. Island in the Mediterranean, 4 m. W. of Leghorn, remembered for two naval battles fought off it. In the first, on May 3, 1241, a Genoese fleet under Enzo was defeated by the ships of the emperor Frederick II and of Pisa. In the second and more important, Aug. 6, 1284, the Pisan fleet of over 70 galleys, commanded by the Venetian Morosini, was defeated by the Genoese, with 88 galleys under Uberto Doria. The defeat of Pisa here marked the end of her rivalry with Genoa.

Melozzo da Forli (1438-94). Italian painter. Born at Forli, June 6, 1438, he was perhaps a pupil of Piero della Francesca, visited Rome in the service of Count Girolamo Riario in 1472, and worked at Urbino, under the patronage of Federico of Montefeltro, duke of Urbino, 1473-76. He is said to have executed some of the portraits in the palace of Urbino, several of which are in the Louvre. He died at Forli, Nov. 8, 1494. Among those of his paintings that remain are his Vatican fresco Sixtus IV and his Court (c. 1476-81); an Ascension of the same period in the Quirinal; and his best-known work, the fresco of the music-making angels in the Vatican art gallery.

Melpomonē. In Greek mythology one of the nine Muses (*q.v.*). She was the muse of tragedy.

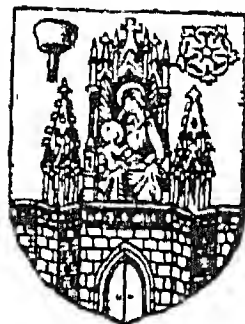


Melozzo da Forli. The Angel Gabriel of the Annunciation
Uffizi Gallery, Florence



Melrose, Roxburghshire. The town as seen from Quarry Hill

Melrose. A police burgh and market town of Roxburghshire, Scotland, on the S. bank of the Tweed, 37 m. S. by E. of Edinburgh. An ancient town pleasantly situated at the base of the Eildon Hills, Melrose is chiefly noted for the abbey founded in 1136 by David I, once the most magnificent edifice in Scotland, and now a splendid ruin (*see* illus. in p. 7). Destroyed by Edward II in 1322, and partly razed by fire in 1385, it was completely ruined by the Reformers in 1545. Alexander II is buried in the abbey, which, in 1918, was presented to the nation by the duke of Buccleuch. A heart found in a leaden casket during excavations in 1921 was believed to be that of Robert Bruce. In the market place is a market cross of 1642. Pop. (1951) 2,146.



Melrose arms

In the vicinity is Old Melrose, where S. Aidan founded a Columban monastery in the 7th century; and the Eildon tree, celebrated for Thomas the Rhymer's meeting with the queen of the fairies. On the other side of the Tweed, and connected by a suspension bridge, is Gattonside.

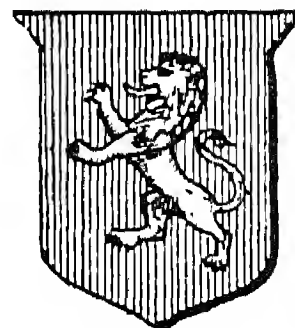
Meltham. Urban dist. and town of the W. Riding of Yorkshire, England. It is 5 m. S.W. of Huddersfield, and makes woollen, silk, and nylon goods, silica brick, and tractors and other engineering products. Pop. (1951) 5,111.

Melting Point. Temperature at which a substance becomes entirely molten or liquid. More strictly the melting point of a substance at a given pressure is the temperature at which solid and liquid are in equilibrium at that pressure. The effect of pressure on the melting point is given by the Clausius-Clapeyron equation $\frac{dT}{dp} = \frac{T(v_l - v_s)}{LJ}$ where dT is the change in the absolute temperature T of the melting point due to a change dp in pressure, L is the latent heat of fusion

(cal/gm), J is Joule's equivalent (the mechanical equivalent of heat), and v_l and v_s are respectively the volumes of unit mass of liquid and of solid, *e.g.* the melting point of ice falls by 0.072°C. for each atmospheric increase of pressure. At one time it was supposed that this temperature would be always constant for each pure substance, but it is now known that mere allotropic modifications — of a metal, for example — may affect the melting point. Nevertheless, the melting points of substances are so far invariable that they are universally regarded as among the physical constants of science. The melting points of metals are of particular importance in metallurgy. Some typical melting points ($^\circ\text{C.}$) are: Hydrogen chloride, -111 ; Ammonia, -78 ; Carbon dioxide, -57 ; Mercury, -38.9 ; Beeswax, 62; Soft Solder, 180; Tin, 232; Lead, 327; Zinc, 419; Sodium chloride, 801; Brass, 900; Copper, 1083; Steel, 1400; Platinum, 1773; Tungsten, 3380.

Melton. Woollen or woollen and cotton cloth, plain woven. The best meltons are all-wool, and in the course of their finishing are well milled or fulled, and their surface, after being brushed up, is closely sheared. The thread structure of the fabric is concealed, and a fine but not bright surface results. It is a heavy weight material suitable for overcoats.

Melton Mowbray. Market town and urban dist. of Leics., England, 14 m. N.E. of Leicester.



Melton Mowbray arms

Melton Mowbray stands where the little rivers Eye and Wreak join. The chief building is the beautiful church of S. Mary, with a fine central tower, partly early English, enlarged during the 16th century. The town has cattle markets, and is famous for its pork pies, cheese, and sausages. It is a favoured foxhunting centre, being in the Quorn country. In Feb.,

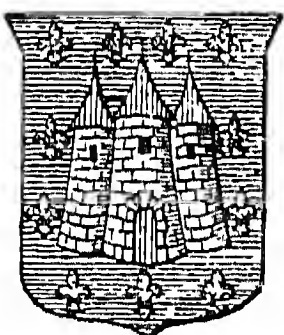
1644, the Parliamentarians were defeated here by the Royalists. It is mentioned in Domesday Book as



Melton Mowbray, Leicestershire. Parish church of St. Mary
Valentine

Medeltune, the second name being in consequence of its association with the family of Mowbray. Market day, Tues. Pop. (1951) 14,052.

Melun. Town of France, capital of the dept. of Seine-et-Marne. It occupies an island in the middle of the Seine, and has spread to both banks, 27 m. S.E. of Paris. There are medieval churches, a fine town hall in the Renaissance style, and ruins of a royal palace.



Melun arms

It was captured by Henry V in 1420, and held by the English for 10 years. Textiles, leather, and pottery are manufactured. Pop (1954) 20,219.

Melusina. The heroine of a medieval French romance, and the legendary ancestress of the house of Lusignan. She was to all appearance a beautiful young woman and married a young nobleman, Raymond of Lusignan, on condition that he should never see her on a Saturday. One day the husband spied upon her at the time of taboo, and saw that she was then half-serpent in form. She flew away in the form of a dragon, to reappear before the death of each of her descendants. The story is a variant of a folk-tale based on the idea of taboo, and found in many parts of the world. The earliest forms of the Melusina legend have been published by the Early English Text Society. The story is dealt with in S. Baring Gould's *Curious Myths of the Middle Ages*, new ed. 1897. See *Psychē*; *Taboo*.

Melville, Viscount. Scottish title borne by the family of Dundas since 1802. Henry Dundas, the politician, was the first holder; he was succeeded by his son Robert,

who became president of the board of control in 1807. From 1812-27, and again, 1828-30, he was in the Tory ministry as first lord of the admiralty. Melville Sound was named after him. His son, Henry, the 3rd viscount, became a general in the army, after having taken a prominent part in the Sikh War. The 5th viscount (born March 5, 1909) succeeded to the title in 1935. The family seat is Melville Castle,

Lasswade, Midlothian. The earldom of Melville is borne with that of Leven. See *Leven and Melville*, Earl of.

Melville, HENRY DUNDAS, 1st Viscount (1742-1811). A British politician. Born and educated in Edinburgh, he became an advocate; in 1766 he was made solicitor-general for Scotland, and in 1775 lord advocate. In 1774 Melville entered parliament as M.P. for Midlothian, and in 1783 Pitt chose him as treasurer of the navy. In 1791 he was made home secretary, in 1794 secretary at war, and during 1804-05 was first lord of the admiralty. In 1806 he was impeached for misappropriating public money while treasurer of the navy, but was acquitted. He died May 28, 1811. Consult *Lives*, H. Furber, 1931; C. Matheson, 1933.

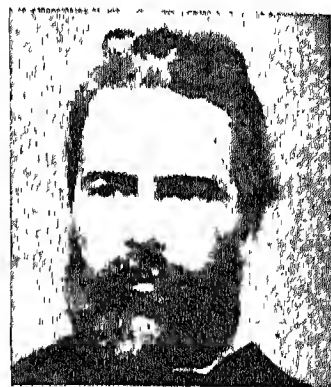
Melville OR MELVILL, ANDREW (1545-1622). Scottish reformer. He was born at Baldovie, Angus, Aug. 1, 1545, and was educated at St. Andrews, Paris, and Poitiers. In 1574 he became principal of Glasgow College, and later of S. Mary's College, St. Andrews. He was a very strong Presbyterian, and his outspoken utterances more than once brought him into trouble. In 1597 he was deprived of the rectorship of St. Andrews, and nine years later was summoned to London by James I to give an account of certain irregular proceedings at Aberdeen. He then proved so contumacious that he was imprisoned for five years in the Tower. On his release, in 1611,



After Raeburn

the king having forbidden his return to Scotland, he went to France, and became professor of biblical theology at Sedan, where he died. A violent controversialist, but generous and patriotic, Melville was one of the chief organizers of the Scottish Church.

Melville, HERMAN (1819-91). American author. He was born in New York City, Aug. 1, 1819, of Scottish descent. At the age of 17 he went to sea and crossed the Atlantic as a foremast man. On his return he acted as schoolmaster during 1837-40, and on Jan. 1, 1841,



Herman Melville,
American author

went to sea again in a Pacific whaling vessel. In the following year, when at the Marquesas Islands, he ran away from his ship and for four months was a captive among the cannibal natives of Nukuhiva. After being rescued he served as a clerk for a time in Honolulu, and returned to Boston in 1844.

In 1846 he published the first of his books, *Typee: a Peep at Polynesian Life*. This received a cordial welcome both in America and England, as a fascinating narrative of life in the Pacific. His later books included *Omoo*, 1847, and a *Voyage Thither*, 1849; *Redburn, His First Voyage*, 1849; *White Jacket, or The World in a Man-of-War*, 1850; and his most famous book, *Moby Dick, or the White Whale*, 1851. He died in New York, Sept. 27, 1891. Consult H. M.: *The Tragedy of a Mind*, W. E. Sedgwick, 1945.

Melville, SIR JAMES (1535-1617). Scottish writer. Sent to France as page to Mary Queen of Scots, he was engaged in the unsuccessful negotiations for the marriage of John Casimir, second son of the elector palatine, to Queen Elizabeth, and of the archduke Charles of Austria to Mary Queen of Scots. He died Nov. 13, 1617. His *Memoirs*, the MS. of which was discovered in 1660, are of great value in studying the history of the period.

Melville, JAMES (1556-1614). A Scottish reformer. Born near Montrose, July 26, 1556, a nephew of Andrew Melville, he was educated at Glasgow university, where he became a tutor. In 1580 he was appointed professor of Oriental languages at St. Andrews. Nine years later he was moderator of

the general assembly of the Church of Scotland; and he took a leading part in the ecclesiastical disputes of his day. He died at Berwick-on-Tweed, Jan. 13, 1614.

Melville Bay. Opening of Baffin Bay, on the N.W. coast of Greenland. It lies between Cape York on the N. and Wilcox Head on the S., contains numerous islands, and is usually blocked with floating ice.

Melville Island. Large island of British N. America. In the Arctic Ocean, between Bathurst and Prince Patrick islands, it is deeply indented. Its maximum length is 210 m., and width about 130 m. It was discovered by Parry, who wintered here 1819-20.

Melville Peninsula. N.E. projection from the Canadian mainland. It is separated from Baffin Island on the E. by Fox Channel and on the N. by Fury and Hecla Strait. To the W. is Committee Bay, while to the S. are Frozen Strait and Lyon Inlet, besides other bays. The chief settlements are Pingitkalik and Agwisseowik, which are situated on the N.E. coast. Its length is 265 m., and average breadth 110 m.

Melville Sound. Large opening of the Arctic Ocean. Situated between Melville Island on the N. and Victoria Island on the S., it communicates with Beaufort Sea through Banks Channel or Maclure Strait, and with the ocean through Byam Martin Channel. Its length is 240 m., and width 140 m.

Member of Parliament. Person elected by popular franchise to represent a constituency in the house of commons. Any adult British subject by birth or naturalisation is entitled to stand as a parliamentary candidate, except if a peer of the realm, a minister of the established Church, a member of the regular armed forces or the civil service, an undischarged bankrupt, a convicted criminal, or a lunatic.

A prospective candidate must be nominated and seconded by two parliamentary electors in the constituency, his nomination paper being signed by eight others. He must deposit with the returning officer on the eve of nomination day £150 in notes. Unless the candidate receives one-eighth of the total votes cast at the election, this deposit is forfeit to the Treasury. Unsuccessful candidates who get a sufficient quota of the votes have their deposits returned immediately, but elected candidates only when they have taken the oath in parliament. Candidates are required to have agents for

election expenses, and to ensure that these expenses are kept within certain legal limits; under the 1948 Act the limit was £450, plus 2d. per elector in co., 1½d. in bor., constituencies. This includes agent's fee, clerical assistance, printing, stationery, rent of committee room and halls for meetings, and a sum for personal expenses. Usually half the outlay is met from party funds, but the Labour party bears the whole cost.

Payment of members (*q.v.*) was introduced in 1911; and an M.P. receives free railway warrants when travelling between the house of commons and his constituency. A pension scheme for indigent ex-M.P.s is in force; all members contribute to this a small fixed annual sum (varied from time to time). Members of parliament are exempt from jury service, compulsory service in the armed forces, and attendance as witnesses upon subpoena. They cannot be prosecuted for libel arising out of any statements made in debate, but such statements may be ruled out of order by the Speaker. Freedom from arrest by the civil or military power was once a prized privilege. It is now confined to civil causes, and applies only for forty days after the prorogation of parliament and forty days before the next meeting.

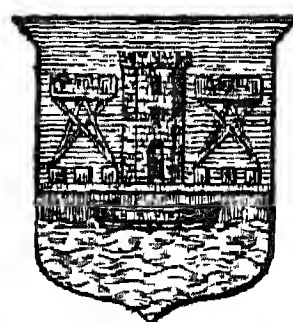
Members who offend against the rules or privileges of the house of commons are dealt with by the house itself. Such breaches of privilege consist of disobedience to the orders of the house; assaults on or insults to members or libels on them; and interference with the officers of the house. After a minor offence the guilty member may be suspended for a sitting or longer period, but where the offence is serious the member may be expelled from parliament.

While the house is in session, a member must not enter it wearing an overcoat or carrying an umbrella. He must not display any papers or books not directly concerned with the business under discussion. Smoking is not permitted in the house, division lobbies, or corridors; food must not be taken inside; but there is no restriction on beverages. No member in debate may mention

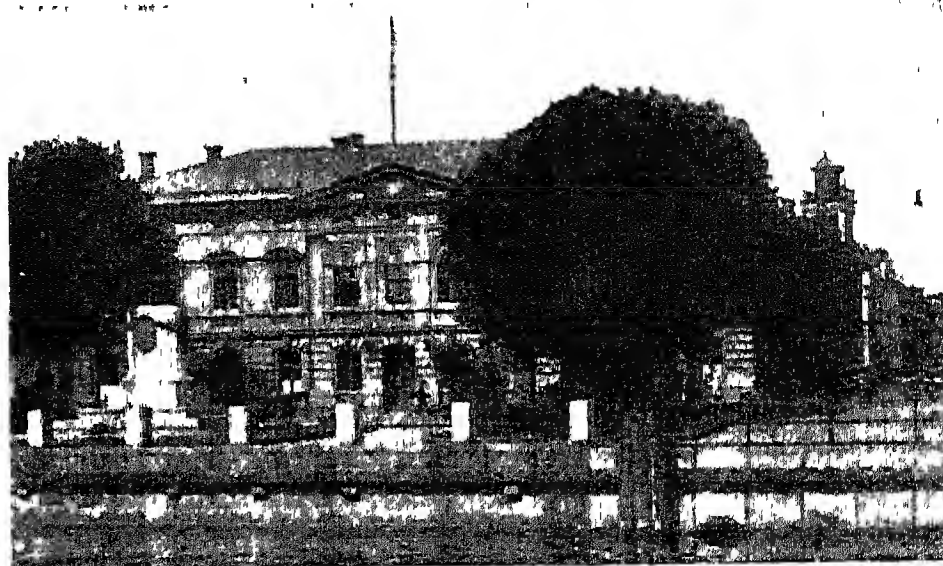
another's name; he must refer to the hon. member for such-and-such a constituency. Ministers are addressed by the name of the office each holds, *e.g.* the secretary of state for war.

Once a member has taken the oath (one of allegiance to the crown), there is no obligation on him to attend sittings of the house. No duly elected M.P. may resign his seat. If he wishes to cease representing his constituency, he must apply for an office of profit under the crown, and so vacate his seat by the provisions of the Act of Settlement (1707). The usual practice is to apply for the stewardship of the Chiltern Hundreds (*q.v.*) or of the manors of Poynings or Northstead, or the escheatorship of Munster. The seat is thereupon declared vacant under the Place Act of 1742, and a writ is issued for a by-election to be held. When an M.P. dies, the Speaker issues a writ for a by-election. Should the member die within the precincts of the house, his body cannot be removed without the consent of the king's coroner, as the houses of parliament rank as a royal palace. *See Commons, House of; Lords, House of; Parliament.*

Memel (Lithuanian, Klaipėda). Town and seaport of the Lithuanian S.S.R. It stands on the Baltic Sea at the mouth of the Dange, which flows into the E. end of the Kurisches Haff. It is 90 m. to the N.N.E. of Kaliningrad (Königsberg), and possesses iron foundries, ship-building yards, and chemical and soap factories. Normally it has a transit trade in timber and grain. The town was founded in 1252 by the Teutonic Order and soon became a trading centre, joining the Hanscatic League. In the 17th century, after a troubled period,



Memel arms



Memel. The Rathaus in this Baltic town and port

it was for some time in the possession of Sweden, and in 1757 and again in 1813 was occupied by Russian troops. Before the First Great War the town, with a strip of territory E. of the river, belonged to Germany, the hinterland being Russian.

On March 17, 1915, during the First Great War, a Russian detachment occupied Memel after a bombardment, but evacuated it soon on the approach of superior German forces. Intermittent fighting occurred in the neighbourhood throughout April. Under the Versailles treaty Memel was detached from Germany to be made autonomous on the model of Danzig; but was annexed by Lithuania early in 1923. This annexation was recognized by the League of Nations, and the Memel statute provided for a large measure of self-government. There was constant friction between the German and the Lithuanian communities, and the government granted many concessions to the former in an attempt to forestall their secession. But in 1938 the Germans had a large majority in the diet, and on March 22, 1939, Hitler presented Lithuania with an ultimatum for the surrender of Memel and the adjoining territory, which were reincorporated in Germany, Lithuania retaining a free zone in the port. During the Second Great War the Russians took Memel by storm Jan. 28, 1945. It was reincorporated in the Lithuanian S.S.R.

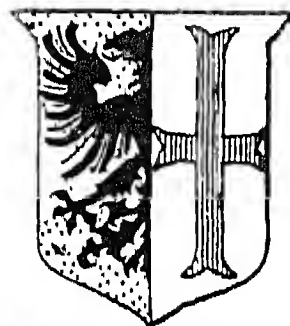
Memento Mori (Lat. remember (you have) to die). Name given to a ring or article of personal adornment fashioned as a reminder of the brevity of life and the certainty of death. A device of medieval origin, it extended to inscriptions and decorations of dwelling-houses, and was adapted to memorial and mourning rings, a death's head or human skeleton of white enamel being attached to the ring by a swivel mounting. Luther wore a gold finger ring with a small death's head in enamel inscribed with the words *Mori saepe cogita* (Think often of death); and round the setting, *O Mors, ero mors tua* (O death, I will be thy death), part of an antiphon. Mary Stuart had a similar ring. Shakespeare has several references to the memento mori, e.g. in *Love's Labour's Lost*, v. 2, where Biron compares the countenances of Holofernes to "a death's face in a ring," and in *King Henry IV*, part 1, iii, 3, where Falstaff declares that he will make as good

use of Bardolph's face "as many a man doth of a death's head or a memento mori."

Memlinc OR MEMLING, HANS (c. 1430-94). Flemish painter. Born at Mümling, near Mainz, or at Memlynck, near Alkmaar, he was apprenticed to a painter in Cologne or Mainz before going to Bruges about 1465. He became a master painter there in 1467, and there he painted Nicolas Spinelli (Royal Museum, Antwerp) and the Donne triptych (Chatsworth). In 1479 he painted The Adoration of the Kings in St. John's Hospital, Bruges, and in 1480 the large Christ the Light of the World (Munich). The altar-piece, St. Christopher (Bruges Museum), was painted in 1484. In 1489 he completed the famous shrine of St. Ursula at Bruges. His altar-piece in Lübeck cathedral was finished 1491. He died at Bruges, Aug. 11, 1494. See Bruges; Flemish School of Painting.



Hans Memlinc
Supposed self-portrait
of the Flemish artist,
at Frankfort



Memmingen arm

Memmingen. German town, in Bavaria. It is about half-way (37 m.) between Ulm and Lake Constance. A free city from 1286 until 1802, when it fell to Bavaria, it has impressive architectural remains of a greater past: the Gothic church of St. Martin (14th-15th cent.), church of the Knights of the Cross (1480), town hall (1589), and guild houses. There are textile and brewing industries. In 1945 the town was placed in the American zone of Germany. Pop. 14,849.

Memnon. In Greek mythology, son of Tithonus and Eos (Dawn). He came to help the Trojans against the Greeks in the last period of the war. Antilochus, son of Nestor, fell before him, but he was in turn killed by Achilles. When they met in the fatal battle, Zeus weighed the fates of the two heroes in the scales, and that of Memnon sank. According to tradition Memnon came from Ethiopia, and it was doubtless due to this tradition that the colossal statues near Thebes, one of which was said to produce a musical note at sunrise, were attributed to him, though they really represented

Amenhotep III, before whose funerary temple they once stood. See Colossus illus.

Memoirs. Literary composition occupying a place midway between the diary and autobiography. Relying largely upon the former for substantiation of facts and dates, it differs in having greater literary finish; it differs from autobiography in its intention of being less a conscious self-portrait than a series of sketches of persons and events with which the narrator has been associated.

As a specific form of literature memoirs made their first appearance in France, the genius of whose people finds in it particularly happy expression. Memoirs, says Demogot, are the flower, history the ripe fruit, of a people, and he points to the fact that the whole 16th century produced but one historian in France, while in the second half of it alone no fewer than 26 writers left permanent memoirs of the events of which they were contemporaries and part. One of the earliest of these was Marguerite de Valois. Other notable names include Madame de Sevigné, Saint-Simon, Madame de Staël, and Madame de Genlis.

No such list of memoirs can be shown by the literature of any other people, however rich in autobiographies, diaries, or reminiscences, set down in their old age by cultivated men and women of the world. Italy's supreme example is Casanova. Germany has no classics in this medium. Greville, and perhaps Lucy Hutchinson, and the Chevalier de Johnstone practically exhaust the list of names that England can produce, for the memoirs of the count de Grammont, though written by Anthony Hamilton, are as foreign as his brother-in-law who is their shameless hero, and of the so-called memoirs that have appeared since the last decade of the 19th century, few have the quality of permanence. See Autobiography; Literature.

Memorial Day. An American public holiday. It was first observed in 1869 to do honour to the memory of Northern soldiers and sailors who fell in the Civil War, and has been held annually ever since on May 30 in the states that fought on the Union side. It now commemorates also those who lost their lives in the Spanish-American War and the two Great Wars. As part of the original celebration consisted in placing flowers on graves, the anniversary is popularly known also as Decoration Day. Southern states observe a

Confederate Memorial Day, but not on a uniform date.

Memorial Hall. Headquarters of the Congregational Union of England and Wales. It is situated on the E. side of Farringdon Street, London, near Ludgate Circus, on the site of the Old Fleet Prison in which were confined two noted divines, Henry Barrows and John Greenwood, for their "persistent Nonconformity." Its erection, completed in 1874, was one of the objects of the bicentenary commemoration of 1862 "to commemorate the fidelity to conscience shown by the ejected ministers of 1662, and to provide accommodation for the Congregational library and denominational societies." Various religious agencies have offices in the building, which is also the headquarters of the National Free Church Council.

Memories and Portraits. Vol. of essays by R. L. Stevenson, published in 1887. The essays, all but three of which first appeared in magazines, are largely autobiographical. They include some college and other memories of the author's early life and vivid studies of his father and grandfather. Among them are *Talk and Talkers*, and *A Gossip on Romance*.

Memory (Lat. *memoria*). The retention in the mind of experiences, ideas, and images which have once been conscious, and their automatic or voluntary recall. Physiologically memory is connected with brain tissue, for destruction of specific areas of this tissue produces amnesia. Definite processes in the nerve fibres of the brain accompany the exercise of memory, but their nature is not yet known.

If two things or events are closely connected in experience (e.g. the scent and the shape of a rose), repetition of experience of one tends to recall the other. When events follow one another in time (e.g. gong—meal) the first will generally recall the second more readily than the second will recall the first. Psychological investigation has demonstrated that no experience important to the individual passes completely from the mind, whether or not it received much attention at the time, though most or all of it will pass sooner or later beyond the power of voluntary recall. This phenomenon was first noticed early in the 18th century when an illiterate German servant girl in delirium was heard to rave in Latin, Greek, and Hebrew. Doctors were able to trace the sentences she spoke to



Memorial Hall. Headquarters, in Farringdon Street, London, of the Congregational Union of England and Wales

books used by a learned rabbi whose servant she had been, and who had been accustomed to read aloud to himself in the course of his studies. Such unconscious retention is now recognized as general, for the buried material can be brought back by hypnosis and in the course of psycho-analysis. In normal life, forgotten occurrences are often enough recalled by some external stimulus such as a scent or a tune.

Factors which assist experience to remain within the power of voluntary recall are subjective importance (one's name and address), constant repetition (common words), and attention. Many memories, therefore, are hardly thought of as such, for they rise to the mind as soon as they are needed without apparent effort. This is true also of "muscular memory" (e.g. playing an instrument) which makes it possible for complicated processes to be repeated without conscious thought. Although close attention given to a happening is one of the things which make it easy to remember, it is not a decisive factor (e.g. a lesson over which great pains have been taken may not be remembered). Nor is repetition decisive, for a single event like a bomb explosion may be remembered in every detail, whereas a succession of such events tend to become confused with one another, and only their common features will remain in mind.

Forgetting is of three kinds—a gradual fading out, and losses of memory due to suppression or to repression. In repression thoughts, etc., can be driven deliberately from the conscious mind until it

has formed the habit of not attending to them (e.g. thoughts of cricket during work), or they may disappear automatically and instantaneously, as when a loss of memory follows a violent shock. the cause of the mind's behaviour is the undesirable or painful character of what is blotted from consciousness. Since both suppression and repression use up energy and entail some mental conflict, they may produce a general weakening of retentive power.

The wide differences between the kinds of events that different human beings find it easy to remember are partly accounted for by this tendency to forget what causes anxiety or guilt. Another cause of such discrepancies is the direction taken by sublimation (q.v.) in the individual. Where a strong primitive impulse has found satisfaction through some particular channel (e.g. combativeness in games, sex in art or mountain-climbing) everything appertaining to the substitute gratification will be relatively easy to remember, though memory in regard to the original impulse may be poor.

Investigation of memory training has shown that (a) working the memory in one field (say Latin grammar) does not improve its performance in another; (b) in learning by heart the matter to be retained should be memorised as a whole, or in as large sections as possible, rather than piecemeal.

The false memories known as "Déjà Vu"—the impression that one has seen before something which in fact is new to one, or been in a place where one is in truth a stranger—are probably due to the fact that the sight, the place, would normally recall a previous experience of a very similar kind, but some disagreeable aspect of the first occurrence makes it impossible to remember it as it was, and all that penetrates to consciousness is the general feeling, "I have seen this—have been here—before." Consult *Psychopathology of Everyday Life*, S. Freud, new ed., 1914; *Psychology of Study*, C. A. Mace, 1932.

Memory Training. The art of cultivating a good memory. The possibility of training the memory has been studied in successive ages from the days of Simonides of Ceos onwards, Roger Bacon, Giordano Bruno, and Leibniz being among the philosophers who devoted much attention to the subject. Recent revival of interest in the matter has produced a number of rival systems. Distinction must



Memphis, Egypt. Colossal statue of Rameses II found recumbent amid the ruins (shown above) of the ancient capital of Egypt, and later re-erected at Cairo. The old Egyptian name of Memphis was Mennofer; the modern name of the site is El Badrashein

be made between systems which aim at improving memory by what may be called rational means and systems worked by mnemonics.

There are generally said to be three kinds of memorising—mechanical or sensational, depending on the grouping of ideas in a certain order by repetition of the words representing them; artificial, the deliberate association of certain ideas with certain words or symbols, *i.e.* by the use of ordinary mnemonics; logical, by the association of the idea with others with which it is logically connected by a thorough grasp of the idea and its implications. The last, being associated with a sound general education, is the best form of memory training, though it may not yield phenomenal results.

Memphis. Ancient capital of Lower Egypt. Situated on the left bank of the Nile, 20 m. S. of Cairo, it was traditionally founded by Mena, the first pharaoh. The Greek form of the Egyptian Mennofer (beauty is established), denoting originally Pepi I's pyramid, the name appears in Hebrew as Moph (Hosea) and Noph (Isaiah). The city was originally called white walls. Under the kings of various dynasties it was embellished with temples and palaces, and, in spite of foreign invasions and other vicissitudes, it remained an important place, the chief garrison city of the country, and at times the royal residence, until the rise of Alexandria. The Romans expressed

admiration for its beautiful buildings, which included a temple to Ptah, the god of the city, and a number built by Rameses II. Petrie excavated the Ptah temple, Apries's palace, XXVIth dynasty, and many workshops and dwellings, during 1909-13. In the nearby acropolis of Sakkara (*q.v.*), the nobles of Memphis were buried. The ruins of Memphis served as a stone quarry for Cairo (where a colossus of Rameses II found recumbent here was re-erected), and its scant remains are unimpressive.

Memphis. City and port of entry of the U.S.A. The largest and the chief commercial city of Tennessee, and co. seat of Shelby co., it stands on a high bluff on the Mississippi, in the S.W. angle of the state. The city commands a wide area annually flooded; hence its name, since the Egyptian city is similarly situated on the Nile. The U.S. army engineers' flood control is directed from Memphis.

More than one-third of the inhabitants are Negro. The rlys. and two steamboat lines serve the city; it is one of the world's greatest cotton ports and has a large export trade in cotton oil cake, used as cattle food. The annual trade of the port is \$250,000,000.

Memphis occupies the site of a fort built in 1739. The town was founded in 1819, incorporated 1826, and became a city in 1849. It was the centre of an epidemic of yellow fever in 1878, when 25,000 people fled the city in a

fortnight. In 1937 floods caused a sudden influx of 60,000 refugees into the city. Pop. (1950) 394,012.

Memphremagog. Lake of N. America, most of it in Quebec, Canada, part of it in Vermont, U.S.A. It measures 30 m. by 4 m. The S. is a noted tourist resort. It drains into the river St. Francis at Sherbrooke.

Mena. According to later tradition, the first pharaoh of united Egypt, and founder of the ancient city of Memphis. The Menes of Herodotus, he has been equated by some with Narmer and with Aha, two early kings who may have united Upper and Lower Egypt. A royal name Men has been found on objects of first dynasty date.

Menaechmi. Name of a comedy by Plautus. The plot turns upon the extraordinary resemblance of twin brothers, sons of a merchant of Syracuse. Having been separated from childhood, after many years they meet at Epidamnus, where one of them has settled, and where the other has landed during his search for his long-lost brother. Each is mistaken for the other by the inhabitants and by the Epidamnian's relatives, which gives rise to amusing incidents. The Comedy of Errors by Shakespeare is based upon this play.

Menagerie. Collection of wild animals kept in captivity for study or exhibition. Such collections were made from very early times, when monarchs brought back specimens of the larger fauna of distant lands they had conquered, to be used in displays and combats in the arena. Later monarchs often maintained private collections, one of the best known being that kept in the Tower of London until early in the 19th century. The admittance of the public to see such collections led to the establishment of zoological gardens, *e.g.* in London and Paris.

Another development was in the travelling shows popular in the last half of the 19th century. Private menageries have been kept by many wealthy zoologists, *e.g.* the



Menaggio, Italy. Tourist resort on the W. shore of Lake Como

11th duke of Bedford, at Woburn Abbey, and the 2nd Lord Rothschild, at Tring, Herts. See Zoological Gardens.

Menaggio. Village and tourist resort of Italy, in Como prov., Lombardy. On the W. shore of Lake Como, at the mouth of the Senagra river, it is 16 m. N.N.E. of Como, and is the starting place of the light rly. to Porlezza, 8 m. distant, on Lake Lugano. Pop. (1951) 3,175.

Menahem, TRIBUTE OF. Tribute of 1,000 silver talents—3,000,000 shekels—paid by Menahem, king of Israel, to the Assyrian king Pul (2 Kings 15). The cuneiform annals of this monarch, now generally identified with Tiglath-Pileser III, for 738 B.C. record "the tribute of Rezin of Damascus, Menahem of Samaria, Hiram of Tyre" and others. An important synchronism between Assyrian and Hebrew chronology was thereby established.

Menai Strait. Channel between Carnarvonshire and Anglesey, Wales, 14 m. long and from one furlong to 2 m. in breadth. It is crossed by two bridges. The Menai suspension bridge, which carries the turnpike road, was constructed by Telford and opened in 1826; it is 1,710 ft. in length and 100 ft. above high water mark. The Britannia tubular bridge was erected by Stephenson and Fairbairn and opened in 1850; it is 1,841 ft. long

and 104 ft. above high water mark, and is traversed by the rly. from Chester to Holyhead. In 1947 a plan was announced for harnessing the tidal energy of the strait by damming it at three points to create two basins.

In the strait is stationed the Conway training ship for officers of the Merchant Navy. Menai Bridge, N.E. of the suspension bridge, is an urban dist. in Anglesey.

Menam. River of Siam. It rises near the N. frontier and flows almost due S. by a tortuous course of some 900 m. to the head of the Gulf of Siam. Its chief tributary, the Meping, drains the N.W. of Siam. Of its deltaic channels, the Taching is the chief and westernmost. Bangkok, the Siamese capital, is 25 m. upstream, and can be reached by vessels which are able to cross the bar at the river mouth. The river is a great national highway.

Menander (342–291 B.C.). Athenian comic poet, chief representative of the New Comedy. A native of Athens, belonging to a wealthy family, he was intimate with the philosophers Theophrastus and Epicurus, and learnt the art of play-writing from his uncle Alexis. He is said to have written 105 comedies, and to have gained the prize eight times. Until the 20th cent. only fragments of his works were known, but papyrus finds in Egypt brought to light more than 1,000 lines from four plays; and the MS. of a complete play, *Dyskolos*, was found in 1957 among papyri in the library of a Geneva collector. Until the Middle Ages, Menander enjoyed a high reputation; thereafter he was less admired. He revelled in moral maxims. Terence called

by Caesar the "half Menander," adapted four comedies from the earlier poet.

Menander's *Mirror* was the general title of a series of essays contributed weekly by Charles Morgan to *The Times Literary Supplement* from Oct. 31, 1942. They were reprinted in a book, *Reflections in a Mirror*, 1944. See *Comedy*.

Mencius (Latinised form of Meng-tse). Chinese moral philosopher (c. 372–289 B.C.), belonging to the school of Confucius. Born in Shantung, he travelled from court to court in search of a prince who would carry out his political principles. He held the people to be the most important part of a state and superior to their rulers, as to whom he expresses himself freely in the treatise which bears his name. He believed in the original goodness of human nature. As economist and social reformer, he was in advance of his age. See *Confucianism*.

Mencken, HENRY LOUIS (1880–1956). American critic. Born at Baltimore, Sept. 12, 1880, he was

educated at its polytechnic and became a reporter. By 1908 he was literary critic for the magazine *Smart Set*, of which he was joint editor, 1914–



H. L. Mencken, American critic

23. With G. J. Nathan he founded the *American Mercury* in 1924, being sole editor 1925–33. Fearless in criticism, Mencken took generally a satirical line and belaboured the academic and "moronic" element in the literary world. His books include *In Defence of Women*, 1917; *The American Language*, 1918 (supplements 1945, 1947); *Prejudices*, 6 series, 1919–27; and the autobiographical *Happy Days*, 1939; *Newspaper Days*, 1941; *Heathen Days*, 1943. He died at Baltimore, after a long illness, Jan. 28, 1956.

Mende. Town of France, capital of the dept. of Lozère. It is 75 m. N.W. of Avignon, on the Lot, at the foot of the Causse de Mende, which rises above it for 1,000 ft. The 14th-century cathedral was rebuilt in the 17th. The nearby hermitage of S. Privat is a place of pilgrimage. Pop. (1954) 7,752.

Mende. Name of a Negro nation, also spelled Mendi (*q.v.*).

Mendel, GREGOR JOHANN (1822–84). Austrian scientist. Born near Odrau in Austrian Silesia, he became a priest and an inmate



Menai Strait, showing, left, the suspension bridge, and, right, the Britannia tubular bridge, which cross the channel

of an Augustinian monastery at Brunn, 1843. There as monk, and



Gregor Mendel, Austrian scientist

from 1860 as a b b o t, he passed his life, while for about 15 years he taught natural history in the school at Brunn. He carried out experiments in the monastery garden from which developed Mendel's laws of heredity. He published his theory in 1866. It lacked recognition until rediscovered 1900, and Mendel died a disappointed man, Jan. 6, 1884. See Mendelism.

MendeléeV, DMITRI IVANOVITCH (1834-1907). Russian chemist. He was born Feb. 7, 1834, at Tobolsk, being educated there and at St. Petersburg university. In 1863 he was appointed professor of chemistry at the technological institute, St. Petersburg and in 1866 occupied the chair of chemistry at the university. There he wrote his Principles of Chemistry, and during this time the periodic law, with which his name is associated, occurred to him. He embodied the results of a comparison of the atomic weights and general properties of the elements, which he undertook with a view of



Dmitri MendeléeV, Russian chemist

proving his theory of periodicity, in a paper read in 1869 before the Russian Chemical Society.

In drawing up the table of the elements according to his periodic conception he left gaps which he predicted would be filled by elements at that time undiscovered. Most of these have since been discovered, and the experimental proof of the existence of universal ether—a corpuscular substance with an atomic weight of 0.000,000,000,053—which he postulated, may yet be forthcoming. MendeléeV died Feb. 2, 1907.

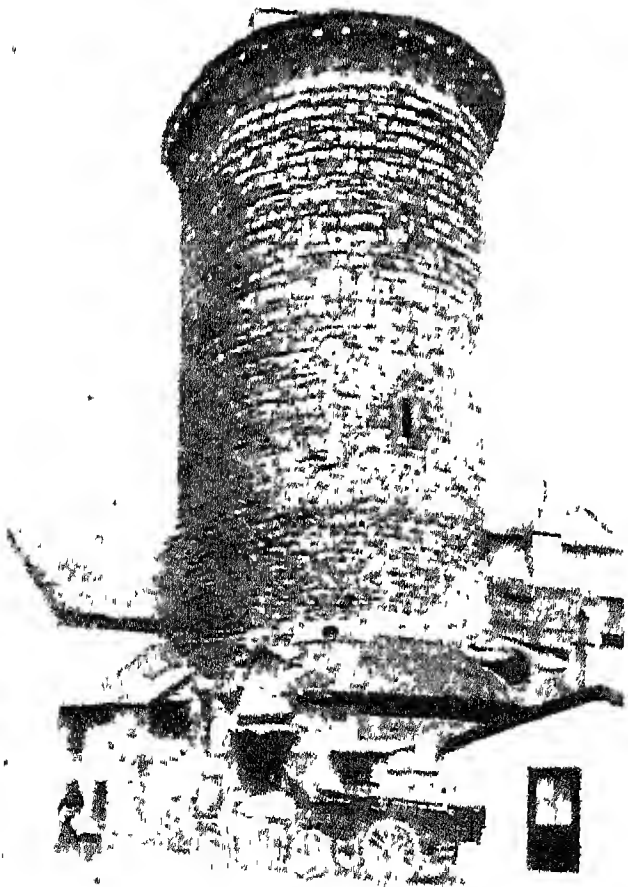
Mendelism. Name given to a set of natural laws controlling the transmission of characters, due to genes in the chromosomes, from one generation of organisms to another. It derives its name from Gregor Mendel (v.s.) who, by paying attention to simple "unit" characters showed that some characters of related organisms are contrastable in pairs, and that among the second generation of progeny from a cross between parents differing in such characters there are to be found members resembling each parent; and deduced that this segregation of characters is explicable only by assuming that a gamete can carry the factor (gene) for one only out of each pair.

Later researches on similar lines have shown that the dominance, which Mendel found one character to exhibit to the exclusion of the other when they were both inherited, does not invariably occur. Mendel crossed a pure bred plant which under normal conditions of self pollination would produce round seeds with another which similarly would form wrinkled seeds. The seeds resulting from this monohybrid (one factor) cross were all round and when the plants into which they grew were allowed to pollinate themselves they formed seeds in the proportions of three round to every one wrinkled, as shown in the table:

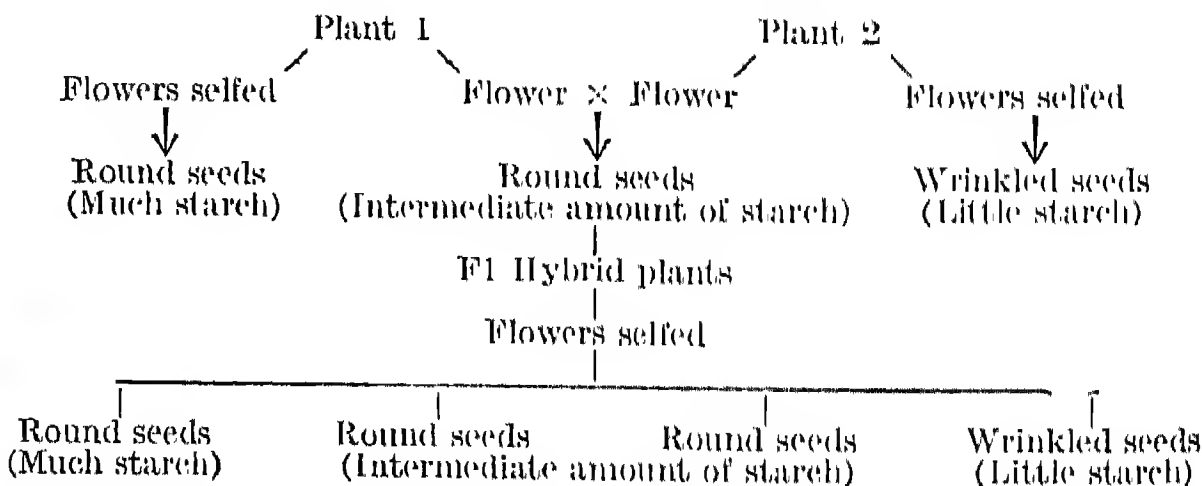
starch grains which dry out slowly so that shrinkage is uniform. On the other hand in wrinkled seeds few starch grains are formed and much sugar left so that drying is rapid and shrinkage uneven. Seeds resulting directly from the cross have a starch content less than one parent and greater than the other, as have two out of every four of their offspring by selfing. All these heterozygotes, despite the fact that their starch content is sufficient to make them round, are intermediates in the real character of starch content. Another example of incomplete dominance is seen in the cross between red and white varieties of *Mirabilis jalapa* which results in an F1 (first filial generation) with pink flowers. Thus both allelic genes may take effect in the heterozygote, though to a degree which varies in various instances from that of complete dominance as in Mendel's tall peas to equality as in *Mirabilis*.

The implication in Mendel's work that characters of related organisms are pairable alternatives has also turned out to be too narrow. Numerous cases are known among both plants and animals in which there is a series of alternatives any one of which may serve as the allelomorph of another. A frequently cited example of this multiple allelomorphism is shown by maize. Here redness may appear in any one or more of husks, silks, pericarp, and cob, giving sixteen possible colour patterns. Any two colour patterns are allelic, and crosses followed by inbreeding of the F1 hybrids result in segregation of parental patterns in a typical monohybrid manner.

Even Mendel's conception of the unity of characters may prove misleading unless it is realized that, as in the round and wrinkled peas, the readily observable feature is not necessarily an intrinsic character of the organism. Without this knowledge it might rea-



Mende, France. Tower of the ancient citadel, now used as belfry. See p. 5637.



It has since been discovered that roundness of the seed is due to the conversion, as the seed ripens, of most of its sugar into many

sonably be expected that a cross between any two strains of white flowered sweet peas would yield white flowered offspring. Actually

when two particular strains of such peas are crossed the F1 have coloured flowers. This is because colour results from two internal conditions engendered by two dominant genes, say C and P. One white parent has the capacity due to C for forming a substance which becomes coloured when in contact with another substance formed by the second parent because its nuclei contain P. There is not one pair of characters, colour and white, but two, productions of two substances with alleles of non-production corresponding to recessive genes c and p. The readily obvious character is often considered as due to the interaction of genes. See the table:

The two white flowered parents
Their gametes which unite ..
The F1 coloured plant ..
The four kinds of gamete formed
by the F1 ..

Within the rectangle the sixteen kinds of plant in F2 resulting in equal numbers from chance mating of F1 gametes.

CCpp	Cp	&	cP	ccPP
	Cp	CpeP	cP	
CP	cP	Cp	cp	
CPCP	cPCP	CpCP	cpCP	CP
CPcP	cPcP	CpcP	cpcP	cP
CPcp	cPcp	Cpcp	cpcp	Cp
CPep	cPep	Cpep	cpep	cp

Of these 9 contain C and P and hence will form coloured flowers; 3 contain C and not P and hence form one only of the substances necessary for colour; 3 contain P and not C and form the other substance only; and 1 contains neither C nor P and forms neither substance: 7 plants out of 16 consequently have white flowers.

In one other way did Mendel fall short of the truth. The characters he selected in peas for his experiments behaved in breeding independently of one another and he drew the conclusion that all characters would do so. The present state of knowledge is that characters are generally transmitted in groups (linked) corresponding to the chromosomes in which their genes occur. Two kinds of deviation from this rule are well known. Reciprocal exchange of members of allelic groups (recombination) occurs in certain instances in a definite proportion of individuals of each generation. This is due to formation of chiasmata between chromatids during meiosis. Members of one group may become transferred without reciprocation to another group in a fortuitous manner. This is in some cases due to the translocation of a part of one chromosome to another during aberrant nuclear division.

Comyns J. A. Berkeley

Mendel Pass (Ital. La Mendola). Mountain route in Trento prov., Italy. It is on the road from Caldaro (Kaltern) to Fondo, alt. 4,460 ft. A cable rly. ascends from St. Anton to La Mendola (Mendel) which is an excursion centre.

Mendelsohn, Eric (1887-1953). German-born U.S. architect. Born at Allenstein, E. Prussia, March 21, 1887, he studied there and at

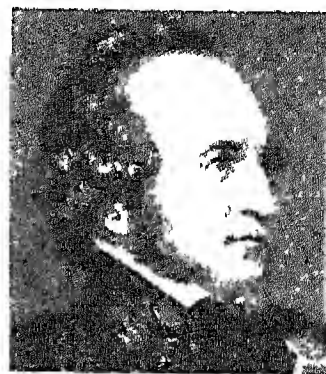
Munich. He won international reputation by designing such buildings as the Einstein observatory tower at Potsdam, and the Columbus House in Berlin. Leaving Germany in 1933 to reside in London, he built the Hebrew University in Jerusalem, a government hospital in Haifa, and the De La Warr pavilion in Bexhill. Member of the Berlin academy of arts before severing his connexion with Germany, he was elected F.R.I.B.A. while in the U.K. Later he went to the U.S.A., taking U.S. citizenship in 1946. He died in San Francisco, Sept. 15, 1953.

Mendelssohn, Moses (1729-86). Jewish philosopher. Born at Dessau, Germany, Sept. 6, 1729,

he was at first in straitened circumstances, but a rich silk merchant in Berlin, to whose children he was tutor, left him the business. He was a friend and collaborator of Lessing, whose Nathan the Wise perpetuates his memory. His works are especially devoted to the promotion of religious enlightenment. Although a jealous defender of his own religion he advocated entire freedom of thought. Mendelssohn contributed greatly to the intellectual enlightenment of the Jews of Germany, and to their social and political emancipation. He died Jan. 4, 1786. His grandson was the composer Felix Mendelssohn-Bartholdy (*v.i.*).

Mendelssohn-Bartholdy, (Jakob Ludwig) Felix (1809-47). German composer. Son of a wealthy Jewish banker, he was born in Hamburg, Feb. 3, 1809, and early showed exceptional musical talent. He studied composition with Zelter, whose friend Goethe he met at Weimar. At nine he appeared at a public chamber concert, and completed his first symphony in 1824. Two years later he wrote the overture to A Midsummer Night's Dream (completing

the incidental music in 1842); this masterpiece established his reputation for genius. Now began lifelong



Felix Mendelssohn-Bartholdy, German composer

friendship with the pianist Moscheles, and in 1825 his father took him to Paris, where he met Rossini and Meyerbeer, the musical giants of the day.

Mendelssohn conducted Bach's neglected S. Matthew Passion in 1828, and initiated the revival of interest in that composer by forming the Bach Gesellschaft. In 1829 he paid the first of many visits to England and Scotland, where he derived inspiration for his Scottish symphony and Hebrides overture. The Italian symphony was finished in 1833, and from that year he occupied positions as conductor and musical director at Düsseldorf, Leipzig, and Berlin, varied by visits to London. After a short residence in Frankfurt he returned to Leipzig, directing concerts, teaching, and at the same time working at his oratorio Elijah, the first performance of which he conducted in Birmingham, Aug. 26, 1846. After having visited England on no less than ten occasions, he died at Leipzig, Nov. 4, 1847.

Mendelssohn's position in musical history has been subject to fluctuation. Early popularity led on to rapturous acclaim, and he was lionised both socially and musically. Now it is conceded that together with a gift for delicious melody and flawless craftsmanship he had a certain superficiality of approach which caused his music to lapse into the sentimental. His most played works besides those mentioned include the overture Ruy Blas; the great violin concerto, string octet, two austere piano trios; and 48 songs without words for the piano, in which category come also characteristic capriccios and fantasies. Mendelssohn's some 80 songs introduced *lieder* into England; their day has waned, but they educated public taste and prepared the ground for Schumann and Brahms. Elijah remains a standard work, almost rivalling Handel's Messiah in popularity.

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Moses Mendelssohn, Jewish philosopher

Mendere, MENDERES, OR MENDER. River of Asia Minor. It flows into the Aegean, S.W. of Aidin, after a course of about 240 m. Anciently it was called the Maeander, and divided Lydia and Caria. So winding is it that the word meander has become a synonym for a circuitous, twisting way of any kind.

Mendes. Grecised name of an ancient city near Tmai el-Amdid, S.E. of Mansura, Lower Egypt. It was the cradle of the XXIXth dynasty. In the 11th dynasty it was already the seat of worship of the sacred ram, usually represented with branching horns surmounted by a uraeus or symbolic serpent. The cult, suppressed by the Persian invaders, was revived by Ptolemy II Philadelphus, 309–246 B.C. Some stone tombs in which the rams were interred are extant.

Mendès, CATULLE ABRAHAM (1841–1909). French poet, novelist, and playwright. Of Jewish origin,



Catulle Mendès,
French poet

he was born at Bordeaux on May 22, 1841, and founded the *Revue Fantaisiste* in 1859, an early rallying-point of the Parnassian movement, of which Mendès was a member. Among his early books of poems were *Philoméla*, 1863, and *Odelette Guerrière*, 1870. He published numerous novels and volumes of short stories, for the most part sensuous and licentious in character, but well constructed and brilliantly written. He also wrote plays and operettes, as *La Part du Roi*, 1872; *Le Capitaine Fracasse*, 1878 (after Gautier); and *La Reine Fiamette*, 1898. From 1893 dramatic critic of *Le Journal*, he was accidentally killed in a tunnel on the Paris-St. Germain rly., Feb. 8, 1909.

Mendi OR MENDE. Negro nation in Sierra Leone, W. Africa, numbering c. 600,000. There are over 60 chiefdoms, each governed by an elected paramount chief who is assisted by an advisory council. Descent and inheritance are in the main patrilineal. Control of behaviour is through secret societies, of which the Poro is the oldest: membership of the Poro is compulsory for men, and initiation at the age of puberty formerly took several years during which instruction in law, crafts, discipline, etc., was imparted. The Sande or Bandu is the corresponding association for women. Rice is the staple food, white supplementary crops

are cassava, yams, and guinea corn: they also grow as cash crops palm kernels, coffee, and cocoa. In 1898 a massacre of Europeans, the immediate cause of which lay in the arrest of chiefs who had refused to pay house-tax, led to a punitive expedition.

Mendicancy (Lat. *mendicare*, to beg). Condition or profession of begging. Specifically, the term is applied to the rule of certain religious devotees and monastic orders whereby they are forbidden to acquire any property, but are required to subsist on the charity of the faithful. The difficulties attending the continued practice of such counsel of perfection, and the defects inherent in the system as a rule of communal life, may be traced in the history of all the mendicant orders that were instituted in Europe from the 13th century onwards. See Monasticism.

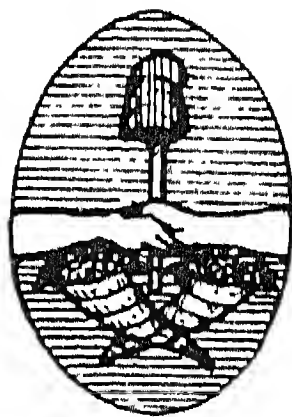
Mendicant Friars (Lat. *mendicans*, begging). Religious orders which depend entirely on the alms of the faithful for their support. While no individual monk or nun can hold or use property for personal profit, most communities as such possess property in the form of endowments or commercial enterprises for their common support.

In the 13th century a new spirit of enthusiasm sprang up under the teaching of SS. Francis and Dominic, and orders of friars were founded, which were forbidden to possess property in any form beyond the houses in which they dwelt. The most notable of these were the Carmelites, Franciscans, and Dominicans. The Augustinians soon followed their example; and in 1487 the Servites were also officially recognized as a mendicant order. At first the members of these orders actually begged their bread from door to door; but this soon ceased. See Dominicans; Franciscans.

Mendicity. Term applied in sociology to the habitual practice of begging as a means of livelihood. Persons who, being able to maintain themselves by lawful labour, refuse to work and resort to begging to get their living, have been the object of penal enactments in England since the time of Edward III, and are now liable to penalties under the vagrancy law. A society for the suppression of mendicity was founded in London in 1818, its principle being to refuse money to beggars, and to give them instead tickets referring them to district officers, where their case is inquired into and dealt with on its merits, labour tests being applied to all fit applicants. See Family Welfare Association; Pauperism.

Mendip Hills. Plateau of S.W. England. It lies between the valleys of the Parrot and Salisbury Avon in Somerset, and is connected by the island of Steep Holm with Glamorganshire across the Bristol Channel. Composed of carboniferous limestone, it duplicates the physical features of the Southern Pennines, with swallow holes, caverns, lead mines, and neighbouring deposits of coal. Cheddar cliffs are, however, unique. The highest point is Black Down, 1,068 ft.

Mendoza. Province and city of W. Argentina. Bounded on the W. by the Andes, it is elsewhere level



Mendoza arms

and fertile, and produces wine, maize, olives, fruit, cereals, cattle, hides, and wool. Its mineral resources include valuable deposits of gold, silver, copper, lead, coal, and petroleum. Area 57,445 sq. m. Pop. (est. 1955) 741,792. Mendoza, the capital, is some 645 m. by rly. W. of Buenos Aires, and is the chief centre of trade between Argentina and Chile, with which it communicates by the Trans-Andean rly. to Valparaiso. Founded 1561, destroyed by earthquake 1861, it was rapidly rebuilt. Pop. (est.) 110,000.

Mendoza, DANIEL (1764–1836). English pugilist, a Jew, born in London. His first big fight was when he beat Sam Martin, the Bath butcher, at Barnet, April 17, 1787. A very quick and clever fighter, he twice defeated Richard Humphries and William Warr, but was beaten by John Jackson at Hornchurch, April 15, 1795. On March 21, 1806, he was successful over Henry Lee at Grinstead Green, Kent. Mendoza's last appearance in the ring was in July, 1820, when he was defeated by Tom Owen. He wrote *The Art of Boxing*, 1789. Mendoza died in London, Sept. 3, 1836. See Boxing.

Menelaus. In Greek legend, king of Sparta, brother of Agamemnon, and husband of Helen, daughter of Tyndarus, king of Sparta. She selected Menelaus as her husband, whereupon Tyndarus resigned the throne to his son-in-law. At the Spartan court Paris, son of Priam king of Troy, was hospitably received, but during the absence of



Daniel Mendoza,
Jewish pugilist

Menelaus in Crete, he carried off Helen, she being the bride promised him by Aphrodite (see Paris). The result of the rape of Helen was the Trojan war. Menelaus fought with Paris, and would have killed him, had not Aphrodite intervened to save her favourite. At the capture of the city, Menelaus regained possession of Helen, whom he forgave for her faithlessness, and after eight years' wandering again reached Sparta, where he and Helen (*q.v.*) lived happily for many years.

Menelek II OR **MENELIK II** (1844-1913). Emperor of Abyssinia. Born at Choa, Aug. 18, 1844, of a long line of Ethiopian kings, he claimed descent from Solomon and the queen of Sheba. In fact his father was little more than one chief among many, but Menelek established his authority on solid and wide foundations. Italian operations on the coast of the Red Sea in 1885 threatened Abyssinian independence, and the treaty of Ucciali signed by Menelek in 1889 was interpreted as giving Italy a protectorate over Abyssinia. But on March 1, 1896, the Italians were defeated at Adowa (*q.v.*). Eritrea was given to Italy, and Menelek was left in peace to develop his country. He showed on the whole an enlightened policy, abolished slavery, and encouraged trade. He died at Addis Ababa, Dec. 12, 1913. See Abyssinia.



Menelik II,
Abyssinian emperor

Menendez y Pelayo, MARCELINO (1856-1912). Spanish poet and critic. Born at Santander, Nov. 3, 1856, he was educated at Barcelona and Madrid universities, his academic career being so extraordinarily brilliant that in 1878 a special Act was passed to authorise his appointment as a professor at 22. A man of great intellectual range, he wrote on poetry, the drama, history, philosophical criticism, and science, besides producing original poems. He died at Santander, May 19, 1912.

Menes. Greek form of the name Mena (*q.v.*), traditionally the first pharaoh of united Egypt and founder of Memphis.

Menevia. Name of a bishopric in Wales of the R.C. Church. The name is that of a traditionally Roman settlement at St. Davids, Pembrokeshire.

Meng-Chiang. Former puppet government of Inner Mongolia. On Nov. 22, 1937, the Japanese established the federated council of Meng-Chiang, having supervisory functions over three so-called federations: (1) the United Leagues of Mongolia, with its capital at Hoko-hoto; (2) Chin-Pei (N. Shansi), capital Tatung; (3) Cha-Nan (S. Chahar), capital Kalgan. In 1939 Meng-Chiang was reorganized under the style of the federal autonomous government of Mongolia, which collapsed with the defeat of Japan in Aug., 1945. The area involved was about 200,000 sq. m., with a pop. of from 5 to 7 millions.

Mengo. Hill near Kampala, N. of Victoria Nyanza, in Uganda. Here is the residence of the king of Buganda and the native parliament house. Mengo is one of the administrative divisions of Uganda.

Mengs, ANTON RAPHAEL (1728-79). Bohemian painter. Born at Aussig, March 12, 1728, he received lessons from his father before proceeding to Rome in 1741. In 1749 he was painter to the king of Saxony. He resided at Dresden till 1752, when he again visited Rome, and became in 1754 a director of the Vatican academy. His ceiling of S. Eusebius and his Mount Parnassus in the Villa Albani were painted in 1757. In 1761 the king of Spain invited him to Madrid. In 1770 he was at work in the Vatican, and returning to Madrid in 1773 he decorated the royal palace. He also painted many portraits. He died June 29, 1779.

Mengtszhsien. Former treaty port in S.E. of Yunnan prov., China, opened to foreign trade in 1889. The town, situated 3,500 ft. above sea level, is on the Kunming-Laokai rly. The existing walls were built in 1615, and a temple to Confucius dates from the 14th century. Mengtszhsien is the chief distributing centre for this part of Yunnan for the trade from Canton to Tongking. It exports tin, mined at Kochu, 20 m. away. Pop. 193,000.

Menhir (Breton long stone). Standing stone, a prehistoric unhewn pillar of stone with earth-sunk base. The largest in Europe is the Menhir-Hroeck Morbihan, Brittany, once 67 ft. high, weighing 342 tons. Others in Brittany are 30 ft. high

or more. There are 1,600 in France, besides 4,600 in rows or circles. They are scattered over Dartmoor, Cornwall, Northumberland, and Wales, often near stone circles; of the three Devil's Arrows, Boroughbridge, Yorks, one is 22 ft. high. There are hundreds in Ireland, the most renowned at Tara, Meath; fewer in Scotland, that at Clachan-Truiseil, Lewis, being 18½ ft. high.

Menhirs are sometimes perforated, or decorated with cup-and-ring markings, spirals, etc. In the S. of France, Corsica, and elsewhere there are "statue-menhirs" roughly carved to indicate a human, usually female, figure, perhaps gods and goddesses. Some prehistoric menhirs were decorated in the Dark and Middle Ages with ogams or Christian symbols.

Ménière's Disease. Disease characterised by sudden attacks of intense giddiness associated with noises in the ears, jerking of the eyeballs, sudden falling to the ground, and other symptoms. Due to disease of the labyrinth of the ear caused by degenerative changes, it was first described in 1861 by the French doctor, E. A. Ménière. Administration of bromide or phenobarbitone affords relief, as does that of the salicylate family. In intractable cases the diseased labyrinth must be destroyed.

Menin (Flemish Meenen). Town of Belgium, in the prov. of W. Flanders. It lies on the Franco-Belgian frontier, on the left bank of the Lys, 6½ m. by rly. from Courtrai. An old centre of the Flemish spinning and lacemaking industries, it suffered extensive damage from its proximity to the fighting line in the First Great War, during which it was behind the German front from Oct., 1914, to Oct., 1918. The Menin Road (to Ypres) was the scene of much heavy fighting. At the



Menin Gate Memorial at Ypres, unveiled in 1927 as a memorial to British soldiers who fell here

Ypres end of the Menin Road a handsome archway called the Menin Gate, designed as a memorial to 54,896 missing British soldiers, was unveiled by Lord Plumer in July, 1927. Menin was captured by Turenne in 1658, passed to Spain in 1678, and was taken by Louis XV in 1744. Its fortifications were demolished under the terms of the treaty of Aix-la-Chapelle, 1748. It was also the scene of a French victory over the Allies, Sept., 1793.

Meningai. Volcanic mt. of Kenya, close to Lake Nakuru. Its height is 7,478 ft., and its crater, 2,000 ft. deep and 8½ m. wide, is the world's second largest.

Meninges. Term for the three membranes covering the brain (*q.v.*) and spinal cord, the dura mater, the arachnoid, and the pia mater.

Meningitis. Inflammation of the meninges. The term pachymeningitis is sometimes used for inflammation of the dura mater, or outermost covering of the brain, and leptomeningitis for inflammation of the arachnoid and pia mater, or inner covering of the brain. Simple acute meningitis may be due to injury of the brain, or abscess or extension of a septic inflammation from the ear, and may also arise in the course of acute infectious diseases, such as small-pox. Syphilis is yet another cause. Tuberculous meningitis is most often met with in children. Cerebro-spinal fever (*q.v.*) is a form caused by infection by a specific micro-organism.

In tuberculous meningitis there is a preliminary stage, before the definite symptoms develop, in which the patient is irritable, sleepless, loses appetite, and becomes emaciated. Irregular fever is frequent. Other symptoms are headache, vertigo, nausea, vomiting. Convulsions and muscular spasms may occur. Delirium, coma, and paralysis may precede death, though many patients recover with anti-tuberculous chemotherapy.

The death rate in meningitis was high, but chemotherapy has reduced mortality. If recovery occurs there may be permanent paralysis of groups of muscles, or impairment of mental faculties. When the condition has run on to abscess formation, surgical measures are usually necessary.

Meniscium. Small genus of tropical ferns of the family Polypodiaceae. They have the leaves undivided, or cut from the edges into simple leaflets. The spore

cases are arranged in uncovered, oblong, or curved masses.

Meniscus. Name given to the curved upper surface which a liquid exhibits when contained in a tube. The curvature of water is downwards, *i.e.* at the sides of the tube the water is drawn up and in the middle it has its lowest level. In a barometer the mercury surface is curved upwards, the level of the top of the column, this time in the centre, being read. Narrow tubes produce greater curvature which can introduce appreciable errors into barometry. The term is also used in optics, a meniscus lens being convex on one side and concave on the other.

Menispermaceae. Family of tropical shrubs, mostly of a trailing habit. They have alternate leaves, and small flowers with the sexes distinct, the sepals and petals similar. The family includes species of *Anamirta*, whose poisonous berries are called commercially *cocculus indicus*.

Menkaura. Egyptian king of the IVth dynasty, son of Chephren. The Mycerinus of Herodotus, he built the third and smallest of the three Great Pyramids of Gizeh. A basalt sarcophagus removed by Vyse in 1838, and intended for England, was lost at sea. His funerary temple was excavated by G. A. Reisner; there are some fine portrait groups of the king with goddesses in Cairo and in Boston, U.S.A.

Menken, ADAM ISAACS (1835-68). An American actress. Born Dolores Adios Fuertes, at New Orleans, she married a Jewish musician John Isaacs Menken in 1856, and was, in turn, ballet dancer, circus performer, artist's model, and equestrienne. She performed at Astley's Theatre, London, 1864, where her equestrian act Mazepa caused a sensation. The friend of Swinburne (who immortalised her as Dolores) and of the elder Dumas, she died Aug. 10, 1868.

Mennonites OR MEMNONITES. Protestant sect founded by Menno Simons (1492-1559) in Friesland. Analogous to the Anabaptists (*q.v.*) from whom they arose, the Mennonites reject all authority in religious matters, believe in the individual interpretation of the Scriptures, and refrain from war, punishment, administration of oaths, and such public duties as the magistracy. The Fundamental Book of Christian Faith, by the founder of the sect, appeared in 1539. The movement spread through Holland, N. Germany, Alsace, and other parts, though varia-

tions of doctrine and practice were frequent, and small congregations are still found in these regions. In the U.S.A. and Canada the Mennonite Church, which dates in America from a settlement in Pennsylvania in 1683, is divided into some twelve branches, and counts about 150,000 members.

Menominee. City of Michigan, U.S.A., the co. seat of Menominee co. It stands on the Menominee river, at its influx to Green Bay, 164 m. N. of Milwaukee, and is served by the Chicago, Milwaukee, and St. Paul, and other rlys. Founded in 1833 as a fur trading centre (chartered 1883), it soon developed an export trade, and became known for cheese production, 2,000,000 pounds of cheese being annually manufactured in the surrounding countryside. It is also a fishing centre, especially for smelt. Pop. (1950) 11,151.

Menomonie. City of Wisconsin, U.S.A., the co. seat of Dunn co. It is on the Red Cedar river, 70 m. E. of St. Paul, and was a thriving centre of timber production during 1846-86, but declined with the clearing of the Wisconsin pine forests. Pop. (1950) 8,245.

Menopause. That point in the cycle of a woman's life when the monthly periods cease. This generally marks the end of her reproductive, though not of her sexual, life. See Change of Life.

Menotti, GIAN-CARLO (b. 1911). Italian-born American composer. Born at Cadegliano, Varese prov., Italy, July 7, 1911, he went to the U.S.A. in 1928, and studied at the Curtis institute of music. A composer and librettist of strikingly dramatic power, he sought to establish a link



G.-C. Menotti,
American composer

between contemporary life and operatic convention, and his music, alternating between melodrama and lyricism, owes not a little to Puccini. In 1936 a broadcast performance of *The Old Maid* and *The Thief* introduced his work to American audiences, and another opera, *Amelia Goes to the Ball*, was performed at the Metropolitan Opera House, New York. Then followed two short operas, *The Medium*, 1946, and *The Telephone*, 1947. With *The Consul*, 1950, Menotti scored a sensational success. This opera, acclaimed in New York

and London, received a hostile reception in Rome and Milan, and provoked controversy wherever it was performed. The following year *Amahl and the Night Visitors* was given its first performance by television in America. Menotti received the Guggenheim award in 1946 and 1947, and the Pulitzer prize in 1950. The *Saint on Bleeker Street*, produced in New York in 1954 and by B.B.C. television in 1956, gained him another Pulitzer prize in 1955. A film version (directed by the composer) of *The Medium* was shown in 1953.

Menpes, MORTIMER (1859–1938). Anglo-Australian painter and etcher. Born in Australia and educated at Port Adelaide, he came to England, and studied in London, afterwards travelling in nearly all parts of the world. Besides producing much original work, he perfected a process for reproducing oil paintings known by his name, founded the Menpes Press, instituted fruit farms at Pangbourne, and wrote a number of books, including reminiscences of J. M. Whistler, his friend and confidant, 1904. He died April 1, 1938.

Menshevik (Russ. *menshe, less*). A Russian political label, dating from 1903. When the Russian Social Democratic party split over the issue of radicalism or moderation in 1903, the less extreme portion were in the minority and were styled Mensheviks. They withdrew from the party and opposed the Bolsheviks in the revolution of 1917. See Bolshevik.

Menshikov, ALEXANDER DANILOVICH (1672–1729). Russian soldier and statesman. Born in Moscow, Nov. 16, 1672, he entered the service of Peter the Great by way of the army, and rose to be field-marshal. He was the chief adviser of Peter, and of Catherine I. The power exercised by one who had risen from the masses provoked the jealousy of the old aristocracy, and Menshikov was deprived of his estates and banished to Siberia in 1727. He died Nov. 2, 1729.

Menshikov, ALEXANDER SERGIEVICH, PRINCE (1787–1869). Russian diplomatist. Born Sept. 11, 1787, he entered the imperial service in 1805, and became the Russian ambassador at Constantinople in 1853, when his conduct of the negotiations with regard to the guardianship of the Holy Places led to the rupture followed by the Crimean War. He was made governor of the Crimea and after the battle of the Alma, where he commanded in person, proceeded to

fortify Sevastopol. He was recalled in 1855, broken in health by the hardships he endured, and as a member of the Council of the Empire was one of the leaders of the reactionary party till his death on May 2, 1869.

Mens Rea. Legal term. The blameworthy condition of mind which with a very few exceptions a person must possess before he can be guilty of a crime. It is not necessary that the accused should know that what he was doing was a crime. In some crimes a specific intent is required, e.g. an assault with intent to do grievous bodily harm, but in other cases it is sufficient to show the accused must have known the act was wrong. Negligence may also be sufficient.

Menstruation (Lat. *menstruus*, monthly). Term for the discharge of blood and mucus which occurs approx. monthly from the uterus of adult women. It is the breaking down and coming away of the uterine mucus-membrane which, in pregnancy the site of a fertilised ovum, at other times grows afresh after each menstrual period. In temperate climates menstruation begins between the years of 11 and 15; in warm climates, and among peoples belonging to warm climates, it begins earlier. The contemporary tendency, for some unknown reason, is towards a later start; but if the function is not established by the age of 16 years medical help should be sought, because too late a beginning implies deficient glandular or organic development which, if untreated, may result in sterility.

Menstruation marks the entry into puberty, and the secondary sexual characteristics become manifest, e.g. enlargement of the breasts in preparation for lactation, and such psychological changes as modesty and manifestations of the maternal instinct.

Menstruation ceases 30 to 40 years after it begins, according to the constitution and family history of the individual. In general, the earlier the beginning, the later the ending. At the time of the menopause, or change of life, the loss of blood may be considerable or irregular; but if slight bleeding persists, medical help must be sought, as this may indicate that the lining of the uterus is unhealthy. Non-appearance of the menstrual flow after the function has begun is called amenorrhoea (Gr. *a*, not, *mēn*, month, *hrein*, to flow). This is normal during pregnancy and the early months of lactation; the glandular secretion from one part

of the ovaries inhibits that from another part which causes the menstrual flow. Ovarian secretions are under the remote but all powerful control of the pituitary (*q.v.*) gland. Shock or change in habit, e.g. removal from one neighbourhood to another may cause amenorrhoea. So also may diseases, e.g. tuberculosis, when amenorrhoea is an economy mechanism to save the patient's strength.

Too much or too frequent loss of blood may be due to glandular disbalance which can be corrected by the physician; or to a tumour or inflammation which needs the attention of the gynaecologist. Too slight a loss also needs gynaecological treatment. Painful menstruation is called dysmenorrhoea (Gr. *dus*, bad, *mēn*, month, *hrein*, to flow). It may be caused by bad position of the uterus inflammation, or tumour, but is more frequently due to pain in the nerves near the mouth of the uterus, and can then be relieved by certain drugs, of which the aspirin and the belladonna groups are particularly useful; or by mechanical stretching of the neck of the uterus. Unless there is some underlying medical or surgical reason for pain, menstruation should not be painful. Some nervous unbalance is common during the menstrual period. Exercise is the essential remedy for discomfort, since it prevents congestion of the uterus, a possible cause of pain, and is a great sedative of the nervous system. See Change of Life.

Hilary Ledgerwood, M.D.

Mensuration. (Lat. *mensuro*, I measure). The application of mathematics to ascertain the lengths of lines, the areas of surfaces, and the volumes of solids. As the word geometry (literally, land measurement) suggests, mathematical principles and methods were developed in grappling with mensuration problems. Many mensuration formulae can be proved geometrically; others involve trigonometry or the calculus.

The following principles simplify much mensuration:

(a) An approximate result may be quite satisfactory for practical purposes, since few measurements can be made accurately to more than four figures.

(b) The length of an irregularly curved line can sometimes be most easily calculated by dividing it into straight portions and curved portions, and calculating the length of each portion separately. The shorter the portions, the more accurate the result will be.

(c) An irregularly shaped surface can often be divided into triangles or rectangles.

(d) An area remains the same if areas are added to it in some places and equal areas are subtracted in others; thus a straight line may be substituted for an irregularly curved part of the boundary, if the areas discarded are equal to those added.

(e) An area can be calculated approx. by tracing it on squared paper and then counting the squares within the boundary, parts of a square being counted as whole squares if they are at least half a square and ignored when they are less.

(f) The volume of an irregular solid can often be ascertained by submerging it in water, and accurately measuring the volume of the water displaced; or by weighing the solid, and then weighing a known quantity of the solid, say, a cubic inch, and dividing the second weight into the first.

(g) In similar figures, that is, figures of the same shape, the lengths of corresponding sides or dimensions are proportional; thus, if two right-angled triangles each have a base angle of 40° , and the base of one is 2 ft. and the base of the other 40 ft., the perpendicular of the second will be 20 times that of the first.

(h) The areas of similar figures are proportional to the squares of corresponding sides; thus, if one circle has a diameter of 3 ins. and another a diameter of 5 ins., while the length of the circumference will be in the ratio 3 : 5, the areas will be in the ratio $3^2 : 5^2$, that is, 9 : 25. This rule applies to areas depicted on maps.

(i) The volumes of similar solids are proportional to the cubes of like dimensions. Thus, if a statue is 6 ft. high and an exact model of it is 5 ins. high, the volume of the statue will be $72^3/5^3$ times that of the model.

(j) Borders are most easily calculated as the difference between the area contained by the border and the area including the border. Thus, the area of a 1-in. border surrounding a rectangle 4 ins. by 3 ins. is $(6 \times 5) - (4 \times 3)$ sq. ins., that is, 18 sq. ins. Similarly, the volume of solid containers can be calculated as the difference between the interior and the exterior volume. Thus the volume of the wood in a box of internal dimensions 1 ft. \times 1 ft. 6 ins. \times 2 ft., the wood being $\frac{1}{2}$ in. thick throughout is $(13 \times 19 \times 25) - (12 \times 18 \times 24)$ cu. ins.

IMPORTANT FORMULAE.

Triangle : Area = $\frac{bh}{2}$, where b

is the base and h is the perpendicular distance of the vertex from the base; also, when the three sides, a , b , c , are known, area = $\frac{\sqrt{s(s-a)(s-b)(s-c)}}{2}$, s being half the perimeter, that is, $\frac{(a+b+c)}{2}$.

Square : Area = s^2 , where s is the length of the sides; diagonal = $\sqrt{2}s$.

Rectangle : Area = ab , if a and b are the lengths of the sides; diagonal = $\sqrt{a^2 + b^2}$.

Parallelogram : Area = ad , if a is the length of one side and d is the distance between it and the other parallel side.

Trapezium : Area = $\frac{1}{2}d(a+b)$, if a and b are the parallel sides and d is the distance between them.

Circle : Circumference = πd , d being the diam. and π approx. 3.14159 (say, $\frac{22}{7}$). Area of circle = πr^2 , r being the radius or $\frac{d}{2}$.

Ellipse : Area = πab , where a and b are the semi-axes.

Cube : Vol. = s^3 , where s is the length of a side. Area of six faces = $6s^2$.

Regular prism : Vol. = $(c.s.)l$, where $(c.s.)$ is the cross-section and l is the length.

Cylinder : Vol. = $\pi r^2 l$; curved surface of cylinder = $2\pi rl$.

Sphere : Vol. = $\frac{4}{3}\pi r^3$; area of surface = $4\pi r^2$.

Pyramid : Vol. = $\frac{1}{3}$ area of base \times perp. height.

Cone : Vol. = $\frac{1}{3}$ area of base \times height. Curved surface = $\pi r \times$ slant height.

Mental Deficiency. Legal term meaning a condition of arrested or incomplete development of mind existing before the age of 18. The Mental Deficiency Acts 1913 to 1927 provide for the safe custody of defectives in institutions or under guardians, subject to supervision by a board of control, of which county and borough councils are constituted committees, and further provide for the management and administration of defectives' property. In Scotland mental defectives come under the Mental Deficiency and Lunacy (Scotland) Act, 1913. See Mental Disorder.

MENTAL DISORDER AND ITS CAUSES

W. Gordon Masefield, M.R.C.S., L.R.C.P., D.P.M., J.P.,
Superintendent, Brentwood Mental Hospital, 1925-46

Here is given an account of the various forms taken by mental disorder, their causation, and their treatment. For legal aspects of the subject, see Insanity. See also Psycho-analysis, Psychology, etc.

Mental disorder is a medical term which includes all forms of abnormality or ill-health of the mind. The psychoses are mental states in which the personality is seriously disturbed and in which the patient's reaction to his environment and to reality is at fault. These types of mental illness constitute what are popularly known as mental breakdowns. The psychoneuroses (or neuroses) are mental states in which there is a partial disturbance of the personality owing to mental conflict or disharmony, but in which the patient retains insight into his condition and a considerable degree of control over his behaviour. Patients in these categories are able to accept and benefit from psychotherapy. The popular name for such minor mental disorder is nervous breakdown. There is no clear-cut difference between the two forms, and the symptoms in both are evidence of some degree of failure to adjust to the conditions of life. The term mental deficiency is used where there is a

condition of arrested or incomplete development of the mind. The mentally deficient are handicapped from an early age, often from birth, either constitutionally or as a result of disease or injury.

In considering the causation of any case of mental disorder it is necessary to take into account the factors of heredity and environment. Direct inheritance of any specific form of mental illness is not common, but in those who spring from a stock of marked mental or neurotic instability heredity plays an important part as a predisposing cause. In such persons the resistance to stresses, whether they be mental (e.g. fears, losses, disappointments) or physical (e.g. infections, injury, disease), is materially lessened and a breakdown results the more readily. It is true, however, to say that if the stress or strain is sufficient the breaking-point may be found in any individual. So every case of mental disorder, whatever the degree, should be considered in detail from the point

of view of (1) family history, (2) bodily or physical condition, (3) psychological background.

The Mental Treatment Act (1930) was a great step forward in bringing the medical treatment of mental disorder more nearly into line with that of other forms of illness. Under Section I treatment on a purely voluntary basis is possible for "any person who is desirous of voluntarily submitting himself to treatment for mental illness and who makes a written application for the purpose." He can then be received into any hospital, nursing home, or place approved by the board of control without a reception order, and he may leave at any time by giving 72 hours' notice in writing of his intention to do so. This period of time is solely for the purpose of notifying the relatives of the patient's decision to leave the place of treatment. During 1947 approx. 50 p.c. of patients admitted to county or county borough mental hospitals were received on a voluntary basis, i.e. they had sufficient understanding to enable them to be willing to receive treatment.

Under Section V of the Mental Treatment Act (1930) certain patients who (a) suffer from mental illness, (b) are likely to benefit by temporary treatment, (c) are for the time being incapable of expressing themselves as willing or unwilling to receive such treatment, may, after a written application of a near relative (or an authorised officer of the local authority) and without a reception order or any legal formality, be received into hospitals or approved homes for a period of six months. Two medical recommendations, one signed by the usual medical attendant and the other by a practitioner approved by the board of control, accompany the application. From the medical point of view cases which are strictly suitable for admission within the meaning of this section of the Act as temporary patients are some of the most acutely ill and yet the most hopeful as regards recovery. Some 14 p.c. of admissions come under this heading.

Even when the facilities for voluntary and temporary treatment are utilised fully, there yet remain, in the present state of the law, 35-40 p.c. of patients for whom certification with legal formalities is necessary because by reason of the nature of the disability the patient can have no proper insight and therefore must be considered to be "unwilling."

The classification of mental disorder is not an easy matter, and no entirely satisfactory scheme has yet been evolved. The following is a practical list and in the present state of knowledge may be considered as useful as any other.

I. Mental Deficiency (*Amentia* or *Oligophrenia*). (a) Idiocy. (b) Imbecility. (c) Feeble-mindedness. (d) Moral Deficiency.

II. Neuroses and Psycho-Neuroses. (a) Neurasthenia (exhaustion neurosis). (b) Anxiety states. (c) Hysteria. (d) Compulsions, obsessions, and phobias.

III. Schizophrenic Psychoses. (a) Dementia Praecox. (b) Paraphrenia. (c) Paranoia.

IV. Psychopathic Constitution.

V. Affective (Emotional) Psychoses. (a) Manic-depressive Psychosis. (b) Involutional melancholia.

VI. Psychoses with toxins or infections.

VII. Epileptic Psychoses.

VIII. Psychoses with organic brain disease.

IX. Psychoses with other organic bodily disease.

X. Senile or Pre-Senile dementia.

Psychological Methods

The treatment of the neuroses is by some form of psychological method (psychotherapy), which aims at solving the problems or mental conflicts that harass the patient—suggestion, persuasion, reassurance, explanation, psychoanalysis, and re-education are the methods used by psychotherapists. Such treatment, for the most part, may be carried out successfully without admission to hospital; but some of the more difficult cases require a period of institutional treatment. On the other hand the main need for the psychoses is hospital treatment, although early diagnosis in an out-patient clinic is the first step. Methods include certain physical treatments, used in carefully selected cases, e.g. shock therapy by cardiazol or electrically produced convulsions; prolonged narcosis; insulin therapy; surgical operations on the brain, termed pre-frontal leucotomy. Thorough physical examination of the patient followed by treatment of any abnormal bodily condition must accompany any specific therapeutic measure designed to alleviate the mental illness. Skilled and specialised nursing is also necessary, with occupational therapy to assist rehabilitation.

The treatment of cases of mental deficiency is summed up in early recognition of the disability

and concentration on training suitable for the individual child.

Advice and treatment in psychiatric clinics, especially in those equipped for dealing with mal-adjusted children, can assist in the prevention of serious mental illness. Developments in social medicine are also needed towards the same end.

Mental Hospital OR MENTAL INSTITUTION. Institution for the treatment of those suffering from all forms of mental disorder. Until the National Health Service Act, 1946, came into effect, July, 1948, and all hospitals became the responsibility of the ministry of Health, county and county borough mental hospitals supplied the need for rate-aided patients, the term used for those who were unable to afford private fees. Registered hospitals, founded as charitable institutions, maintained by bequests, voluntary contributions, and fees of paying patients, and managed by committees, catered for those of limited means.

Private mental homes (licensed houses), owned by individuals, charge fees according to the accommodation; they provide treatment. A patient may be received, under certain regulations, in "single care" in a private house. In all cases patients under care and treatment are visited and reported upon by the commissioners of the board of control. Under the Home Office, an institution for insane criminals exists at Broadmoor.

Those suffering from mental deficiency are treated in certified institutions maintained at public expense unless their parents or guardians can pay the fees charged by certified houses under private management. There is provision for criminal or dangerous mental defectives in state institutions.

Some cases of mental deficiency can be boarded out under guardianship (Mental Deficiency Acts 1913 and 1927). See Insanity; Mental Disorder.

Menteith. LAKE OF. Lake in the S.W. of Perthshire, Scotland. It is 17 m. W.N.W. of Stirling, 1½ m. long and 1 m. broad, and is the only sheet of water in Scotland termed a lake. It contains three islands, on one of which, Inchmahome, are the remains of a priory, the residence of Mary Queen of Scots in 1547-48, and on another, Inchtalla, the ruins of a stronghold of the earls of Menteith.

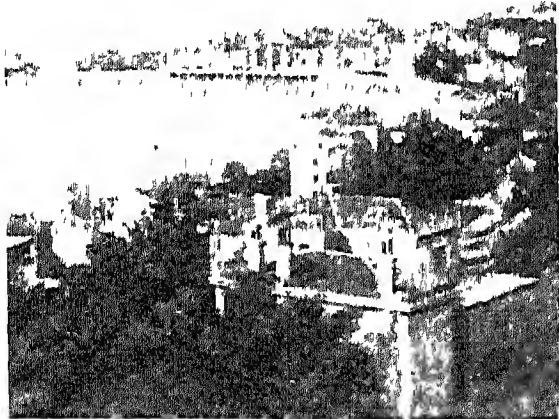
Menthol (C₁₀H₂₀O). Crystalline constituent of peppermint oil, which deposits from the oil on long keeping or cooling to a low temper-

ature. It is also known as peppermint camphor and is classed as a stearoptene. The peppermint plant is cultivated in England, China, Japan, and the U.S.A., but the menthol content of the oil distilled from the plants varies according to the locality and variety of the plant. The Japanese peppermint is the *Mentha arvensis* var. *piperascens*, and the oil contains such a large proportion of menthol that it is solid at ordinary temperatures. The application of cold ensures the complete separation of the menthol, the liquid oil being removed by pressing the crystals. Menthol has a local anaesthetic effect in cases of neuralgia. It finds uses in confectionery and perfumery.

Menton (Ital. Mentone). Health resort of France, in the dept. of Alpes-Maritimes. It is on the coast of the Riviera, 14 m. N.E. of Nice. The neighbourhood is noted for its orange and lemon groves. Owing to its mild climate and charming surroundings, it is visited by thousands every year. There is a casino, with a winter garden, skating rink, and other attractions, several promenades, including the promenade du Midi, beautiful pub



Menton arms



Menton. Popular health resort of the French Riviera

lic gardens, a museum, etc. Much of S. Michael's church has been rebuilt. The old town has a harbour. It became French in 1861, when the prince of Monaco sold his rights. Olive oil and perfumes are exported. Pop. (1954) 17,109.

During the Second Great War Menton was occupied by the Italians, June 24, 1940, but was "returned" to France by the Germans, and occupied by them, Sept. 1943, after the Italian surrender to the Allies. Allied landings, under cover of naval bombardment, were made in the area on

Sept. 8, 1944. the town was liberated by U.S. forces, Sept. 24.

Mentor. In Greek mythology, the faithful and prudent friend to whom Odysseus, when he left home for the Trojan War, entrusted the care of his affairs and the education of Telemachus. Mentor has become synonymous with a wise counsellor.

Mentzelia. Genus of herbs, of the family Loasaceae, natives of the warmer parts of America.



Mentzelia. Leaves and flowers of this American herb. Inset, single flower

They have coarsely toothed leaves, and large orange or white flowers, which expand only in sunshine. *M. bartonioides*, with yellow flowers containing a profusion of stamens twice the length of the petals, is a very showy annual.

Menufiyeh. Province in Lower Egypt. It contains the districts of Ashmun, Menuf, Quesna, Shibin-el-Kom, and Tala, and comprises the S. portion of the fertile Nile delta. Area, 606 sq. m. Pop. 1,159,701.

Menuhin, YEHUDI (b. 1916). American violinist. Born of Jewish stock in New York, April 22, 1916, he received his musical training from Persinger at San Francisco, Georges Enesco in

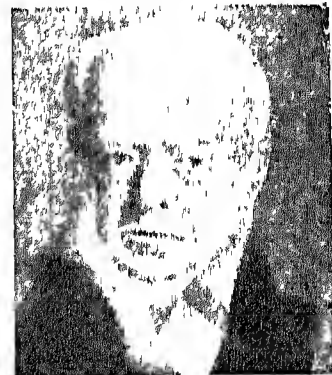


Yehudi Menuhin, American violinist

Paris, and Adolf Busch in Switzerland. At seven he appeared as violin soloist with the San Francisco symphony orchestra; at eleven he played in Paris and with the New York symphony orchestra, giving brilliant performances of the Beethoven concerto. With his sister Hepzibah (b. 1921), herself a fine pianist and frequently his accompanist, he achieved world fame, and in 1929 made his Berlin debut and appeared at Queen's Hall, London. In 1935 he completed his first world tour, then retired to his Californian ranch, to return to the concert platform in 1937. During the Second Great War he raised by recitals large sums for the benefit of victims and refugees. Menuhin's playing was marked by warm, sympathetic tone as well as virtuosity. His researches rescued from oblivion concertos by Schumann and Mozart, and the complete works of Paganini.

Menzala, MANZALA, OR MENZALEH. Lagoon in Egypt, extending from the Damietta branch of the Nile to Port Said and the Suez Canal. With an area of about 780 sq. m., it is separated from the Mediterranean by a narrow strip of sand through which are several openings, and contains several small islands, including Tannis or Tenneis, the ancient Tennesus. The lake produces fish and salt.

Menzel, ADOLF FRIEDRICH ERDMANN VON (1815-1905). German artist. Born at Breslau, Dec. 8, 1815, he executed pen-and-ink drawings for Goethe's *Künstlers Erdmann von*, 1833. Between 1839-42 he published over 400 drawings. An exhibition of his work



A. F. E. Menzel, German artist

was held in London, 1903. He died in Berlin, Feb. 9, 1905.

Menzel, WOLFGANG (1798-1873). German author. He was born at Waldenburg, Silesia, June 21, 1798, and educated at Breslau, Jena, and Bonn. In 1825 he settled at Stuttgart, where he lived for many years. His most important works were a *History of the Germans*, 1824, Eng. trans. 1848; *German Literature*, 1827, Eng. trans. 1840; *German Poetry*, 1858; and *Europe*, 1853. He died April 23, 1873.

Menzies. A mining town in Western Australia, 466 miles by rail from Perth. It is the centre

of North Coolgardie and Mt. Magnet Goldfield. Pop. 2,500.

Menzies, ROBERT GORDON (b. 1894). Australian statesman. He was born December 20, 1894, at

Jeparit, Victoria, and educated at Grenville College, Ballarat, and Melbourne university. Menzies practised as a barrister and entered the Victorian parliament in



R. G. Menzies
Australian statesman

1928, going to the Federal House of Representatives in 1934. He was Commonwealth attorney-general, 1935-39, and prime minister of Australia, 1939-41. Leader of the opposition from 1943, he became premier of the 1949 coalition govt. He was made a privy councillor in 1937, C.H. in 1951.

Mepacrine. Another name for the quinine substitute Atebrin (*q.v.*).

Mephistopheles. In German legend, the familiar spirit attendant upon Faust. He is summoned, with terrible incantations, by the doctor, as recorded in the old History of Dr. Faustus. Frequently misunderstood as being Satan himself, he is properly a subordinate demon. The name, perhaps of Hebrew origin, is found in Shakespeare's Merry Wives of Windsor in the Grecised form Mephostophilus, *i.e.* not loving light. See Faust.

Meppel. Town of the Netherlands, in the prov. of Drenthe. It is situated on the Meppeler Diep and other waterways, 16 m. by rly. N.N.E. of Zwolle, and is the junction of the Leeuwarden and Groningen lines. Pop. 12,133.

Mequinez OR MEKNES. (City of Morocco. It is 34 m. W.S.W. of Fez, and lies in a fertile valley with the forested slopes of the Middle Atlas to the S.E. Formerly in the French zone, it was during the French regime much extended, both the Arab and the European sections being developed. Pop. (est.) 150,000.

Merano (Ger. Meran). Inland health resort of N. Italy, in Bol-

zano prov., Trentino-Alto Adige. It is 15 m. N.W. of Bolzano (Bozen) on the Passirio (Passer), a tributary of the Adige. In the neighbourhood is the half-ruined castle, the earliest residence of the counts of Tirol. The district is noted for its orchards and vineyards. Pop. (1951) 31,495.

Mercantile Agent. An agent who in the ordinary course of his business has authority to sell or buy or raise money on the security of goods. Both factors and brokers are mercantile agents. A sale by him of goods in his possession may be binding on his principal even though the sale was unauthorised.

Mercantile Law. In England, the law as it especially affects merchants, *i.e.* people whose business it is to buy and sell. At one time the Law Merchant (*q.v.*), as it is properly called, only affected traders; but now it is universally binding. Within the province of mercantile law falls the law relating to negotiable instruments, which indeed are negotiable only by the usages of merchants. Besides cheques, bills of exchange, and promissory notes, any other instrument may become negotiable by the universal usage of merchants who deal in them, unless such negotiability is in some way opposed to their terms. The sale of goods, mercantile contracts of carriage, involving charter-parties, bills of lading, freight notes, contracts of marine insurance, are also part of mercantile law; and so are contracts of commercial agency, involving the law as to brokers, factors, warehousemen, and the like.

The main feature of mercantile law is that it is made up almost entirely of the customs and usages of traders. No one, however, will be entitled to rely on a usage against commercial morality—as where a broker on the tallow

market proved that it was the custom for brokers in that market to buy large parcels of tallow, and then, when they received orders to buy for customers, to allot some of their own tallow to meet the order at market price. The court held that no man employed as an agent to buy could sell his own goods to his principal, because it was contrary to morals.

Mercantile System. Name given, especially by writers of the 18th century, to attempts to secure by artificial restrictions an excess of exports over imports. Until comparatively recent times it was generally believed that a country's wealth consisted solely of gold and silver. This belief gave rise to repeated prohibitions in most European countries, from Cicero's time to that of Henry VIII, against the export of coin or bullion. But in 1600 the E. India Co. obtained permission to export foreign coin or bullion to the amount of £30,000 a year, on condition that an equal amount was imported after the return voyage. This concession was supported by the argument that most of the commodities brought to England were re-exported, thus bringing back in exchange more bullion than was required for their original purchase. From this arose the theories of the balance of trade and of the desirability of ensuring an excess of exports over imports. In 1663 the prohibition against the export of foreign coin and bullion was removed by parliament. See Exchange; Free Trade; Freezing; Political Economy; Protection; Tariff Reform.

Mercaptans OR THIO-ALCOHOLS. Name given to a class of organic chemical compounds, constituted like alcohols, but with the oxygen of the hydroxyl group replaced by sulphur. The liquids of the group are colourless, with most offensive odours. They may be made by the action of potassium hydrosulphide on alkyl halides.

Mercator, GERARDUS (1512-94). Flemish geographer. His real name was Gerhard Kremer. Born at Rupelmonde, March 5, 1512, he graduated at Louvain, and devoted himself to mathematics and geography. In 1534 Charles V employed him as cartographer in his campaigns. His survey of Flanders was made 1537-40, his Map of the World in 1538, and in 1541 he constructed his terrestrial globe. In 1552 he went to Duisburg, and in 1559 became cosmographer to the duke of Cleves. In



Merano. General view of this Italian health resort



Gerardus Mercator,
Flemish geographer

1568 he produced the first maps on his system of projection with parallels and meridians at right angles known as Mercator's projection, or gnomonic projection (*q.v.*) Other maps followed, and in 1585 the first portion of his atlas was produced. He died at Duisburg, Dec. 2, 1594. See Map.

Mercedario. Peak of the Andes in S. Chile. It reaches a height of 22,000 ft.

Mercedes. (1) Town of Argentina, in the prov. of Buenos Aires. It stands in a plain, 56 m. by rly. W of Buenos Aires. A rising town, it has steam mills and soap works. There is a large Irish colony. Pop. 40,000. (2) Town of Argentina, in the prov. of San Luis, 54 m. by rly. E.S.E. of San Luis city. Pop. 22,800. (3) Town of Uruguay, the cap. of the prov. of Soriano. It stands on the Rio Negro, 21 m. E.S.E. of Fray Bentos. It is a popular health resort, with many fine buildings, and carries on a large trade in animal products, chiefly wool. Pop. 24,000.

Mercédès-Benz. German engineering firm. From the very early days of motoring the names of Mercédès and Benz have been renowned. The Mercédès cars gained a reputation for advanced features of design and were among the fastest standard cars in the world, the racing models attaining successes in many classic races. The firm also made aero and Diesel engines which were extremely efficient. One of the principal factories at Mannheim was destroyed by Allied aircraft during the Second Great War.

Mercenary (Lat. *mercenarius*, from *merces*, reward). Term applied specifically to a soldier who hired his services to any state or prince that would employ them, or who was so hired out by the sovereign to whose army he belonged. Mercenaries were used by Greece and Rome, and the employment of barbarian troops was one of the chief causes of the downfall of the Roman empire. In the 16th century Coligny and the Huguenot leaders hired Protestant English and Germans to fight against the French Catholics under the duke of Guise, who engaged Swiss troops. These soldiers of fortune were apt to mutiny when their pay was in

arrears, though pillage was regarded as one of their emoluments. On being disbanded they often took to brigandage. In the 18th century the British Government employed Hanoverian and other German troops, who were hired out by their own sovereigns. The German Legion attached to Wellington's army in Spain bore a high reputation. After the introduction of conscription by Prussia it was common for German writers to refer to the British and American armies as "mercenaries," because the men were more highly paid under the free contract system called enlistment (*q.v.*).

Mercer. Person whose business consists in retailing silks, velvets, and other rich stuffs. The term seems to have applied at one time to dealers in any textiles, but the differentiation between mercer and draper was very early made. See Mercers' Company.

Mercer, JOHN (1791-1866). English dye chemist. Born at Dean, near Blackburn, Feb. 21, 1791, he was apprenticed in 1809 at the Oakenshaw Print Works, where he studied dyeing. He was almost entirely self-educated, but made many important discoveries connected with dyeing and calico printing, and he is chiefly known for the invention of mercerisation (*v.i.*). Elected F.R.S. in 1852, Mercer died Nov. 30, 1866.

Mercerisation. A process by which cotton is given a silky lustre or sheen resembling silk. It derives its name from John Mercer, who patented his discovery, in 1850, of the action of alkalis upon vegetable fibres. When cotton fibres are immersed in a strong bath of caustic soda, their structure is altered, the fibres becoming thicker and shorter. If, however, the fibres are kept at a tension and washed, the material takes on the characteristic sheen. Not only is the appearance of the cotton improved, but it gains a greater affinity for dyes. Mercerising is done either upon yarn or upon the cloth. The latter, after being impregnated with dye and allowed to contract, is pulled out to its former width upon a stentering frame, sprayed and washed. By treatment with acids mercerised cotton has been made to imitate silk very closely. See Cotton.

Mercers' Company. Premier livery company of the city of London. Originally a guild of dealers in small wares, *i.e.* articles sold retail by the little balance, and then vendors of silks and velvets. the Mercers are first mentioned as

a guild in 1172. The company of Merchant Adventurers arose from this guild in 1296, and down to 1526 the two organizations recorded their transactions in the same books. The Mercers' parent charter, one of ten, was granted in 1394. Its members have included Richard Whittington, Sir Geoffrey Boleyn, great-grandfather of Queen Elizabeth I, Sir Henry Colet, father of Dean Colet, Sir Thomas Gresham, Sir Hugh Clopton, Sir Richard Gresham, and Sir Baptist Hicks, later Viscount Campden, and also the following English and British sovereigns: Richard II, Elizabeth I, Edward VII, George V, Edward VIII, and George VI.

The company governs S. Paul's School, now at Hammersmith, and the Mercers' School, now occupying the site of Barnard's Inn, Holborn; and in addition to administering many other important charities is trustee in perpetuity of the estates of Richard Whittington and Dean Colet, the founder of S. Paul's school.

The arms, including a figure of the Virgin, and the precedence of the company are the subject of a song written in 1686.

In 1519 the company erected a chapel and hall next to S. Thomas of Acon's church in Cheapside; at the dissolution of the monasteries the company purchased the site of the hospital of S. Thomas of Acon. The Mercers' School originated as a school attached to the hospital of S. Thomas of Acon.

The hall of the company and much other property was burnt in 1666, involving the company in debt until 1804. The hall was rebuilt in 1672 and in 1941 it was destroyed in an air-raid. With valuable portraits and other relics the company possesses in the Leigh Cup a fine example of English medieval plate.

The Mercers' Hall is in Ironmonger Lane, London, E.C.2. Consult The Mercers' Company, Sir John Watney, 1914; Mercers' Hall, A. E. Raydon, 1947.

Merchandise Marks Act. British statutes designed to protect manufacturers against imitations of their marks. The Merchandise Marks Act of 1887 made it an offence falsely to apply to goods any trade mark or description. That of 1926 required all imported goods bearing the name or



Mercers'
Company arms

trade mark of a British manufacturer to indicate also where the goods were made.

Merchant. Person whose business is the purchase and sale of commodities. In modern English the term is applied only to wholesale dealers, *i.e.* intermediaries between the manufacturer and the retailer whose profits are not restricted to brokerage, and to those who purchase foreign goods direct from abroad, or from importing houses for distribution to the home trade. *See* Broker.

Merchant Adventurers. Name of an English regulated company for the conduct of foreign commerce. The exact date of its foundation is uncertain, but its growth coincided with the great development of the English cloth trade in the 14th century. Chiefly concerned with the export of cloth, its members were the leading merchants from all parts of England, and its foreign staple or trading centre was fixed at Bruges by Edward III in 1344. In 1407 they acquired the right of choosing their own governor; in 1501 a charter gave them rights of managing their own trade and of punishing those who broke their rules. Leaving Bruges for Antwerp, they gradually obtained privileges in other Netherlandish towns, and in 1578 they moved their foreign headquarters to Hamburg. Expelled thence by the influence of the Hanseatic League (*q.v.*), in return for which the English expelled the Hanse traders from England in 1597, they afterwards recovered their position in Hamburg. The constitution of the Merchant Adventurers formed the model for many similar associations of great commercial importance, *e.g.* there were companies of Merchant Adventurers at Bristol and at York. *See* Staple.

Merchant Aircraft Carrier. Type of small escort vessel developed in the Second Great War to combine the function of cargo vessel and aircraft carrier. They were generally grain ships or oil tankers fitted with flight decks for the take-off and landing of fighter aircraft. They were operated by Fleet Air Arm pilots. Introduced in 1943, merchant aircraft carriers helped to defeat the U-boats in the battle of the Atlantic by providing air cover for themselves and other vessels negotiating the passage through the 500-mile "air gap" out of range of land-based aircraft until Portugal granted the U.K. the use of bases in the Azores, Oct., 1943.

MERCHANT NAVY OF GREAT BRITAIN

W. E. Stanton-Hope, F.R.G.S.

The history, from its beginnings, of the seafaring service which has carried British trade and influence all over the world. Other articles bearing on the subject include Blue Ensign; Lifeboat; Lloyd's; Lloyd's Register of Shipping; Red Ensign; Trade, Board of; Transport, Ministry of

The name merchant navy is given to shipping engaged in commerce. It includes all sea-going vessels that convey passengers and/or cargo; also cable ships, tugs, etc. Those employed in this service are described as members of the merchant navy. The flag worn by British merchant vessels is the red ensign, or, in ships manned by a stipulated proportion of Royal Naval reserve officers and ratings, the blue ensign.

Formerly the service was known as the mercantile marine. The change in name was made in April, 1928, when George V created the new office of Master of the Merchant Navy and Fisheries, and appointed the then prince of Wales to be its first holder.

From the reign of Richard II, the English shipping industry has been assisted by protective legislation. In the 17th century the merchants benefited by the Navigation Acts designed to eliminate foreign competition. These Acts provided among other conditions that no cargoes could be brought to England from, or exported from England to, many parts of the world except in English ships.

Freedom of the Seas

The substantial development of England's commercial sea-power, however, dates from Elizabeth I's declaration that "the use of the sea and air is common to all, and no title to the ocean can belong to any nation. . ." Thereby defiance was given to "the closed sea" policy of Spain and Portugal, the great maritime powers of that period who claimed sovereignty over the seas discovered by their pioneer navigators. Not long afterwards (in 1577) the new era of "the freedom of the seas" was inaugurated by Drake who sailed from Plymouth in the *Pelican*, 120 tons (later renamed the *Golden Hind*), the largest of five ships of a squadron that set out to circumnavigate the world.

An early result of the declaration was that English merchants formed companies—the famous Merchant Venturers among the number—and sought charters for trading privileges in distant parts of the globe. The East India Co., greatest and most enduring of all, was granted a charter by Queen

Elizabeth in 1600, and built a fleet of ships which were armed as a defensive measure.

When England was threatened by war in the Middle Ages and under the Tudors, it was not unusual for small coasting vessels and fishing craft to be commandeered for troop transports. Structures of wood were added fore and aft to serve roughly the purpose of fighting-tops. These were known as "castles," probably an ironic term, but one that survives in the word forecastle (usually abbreviated to fo'c'sle).

Decline and Recovery

British shipping suffered a decline in the first half of Victoria's reign. Many ships were ill-found, and indiscipline and inefficiency were not uncommon among merchant officers and crews. Traders claimed that the Navigation Laws, designed against foreign seaborne trade, had become a handicap rather than a help, and they were repealed gradually, the last being abolished in 1854. From that date British shipping embarked on an era of prosperity, partly due to the stimulus of keen competition, but chiefly to the industrial revolution at home and the vast new markets that it opened overseas.

The average size of British merchant ships increased only by 80–100 tons during the 18th century; before the close of the 19th there were vessels afloat of several thousand tons. The period 1800–1900 witnessed the heyday of sail and the coming of steam. The fast clippers and other sailing craft produced generations of hardy seamen. Great Britain seized the opportunities in shipbuilding offered by the substitution of iron and steel for wood, of engines for sail, and the high standard of efficiency in the British merchant navy of today is due in large measure to the unequalled skill of British shipbuilders and marine engineers.

The First Great War

Almost immediately after the outbreak of war on Aug. 4, 1914, the Admiralty acquired 22 liners for conversion to auxiliary cruisers, and a large number of merchant officers and ratings transferred to service under the white ensign. At least 100 such auxiliary

cruisers were on active service during the First Great War, and a similar number of cargo vessels were in commission as "mercantile fleet auxiliaries." The latter class performed the duty of supplying stores and other necessities to warships of the fleet. Pleasure steamers and innumerable fishing craft—steam trawlers and drifters—were used for minesweeping or anti-submarine patrol. A total of 4,696 merchant ships, totalling 9,412,275 gross tons, were lost during that war. Of these 915, representing 1,048,498 tons, became casualties owing to storm, fog, or other causes officially classed as acts of God. The rest were lost through enemy action; 14,287 officers and ratings sacrificed their lives. But for the introduction of the convoy system in 1917, the losses of ships and men might have continued on a scale fatal to Britain's chance of victory. Honours won by members of the British merchant service totalled 1,519, including six V.C.s. In 1919 George V awarded the British war medal to those who had served at sea for not less than six months during the period of hostilities. A mercantile marine medal was granted also to those with not less than six months' wartime service at sea who, in addition, had served for at least one voyage through an officially recognized danger zone.

Between the Wars

The vessels to standardised design built during the war for specific purposes proved unsuited to trade requirements of peacetime; the depleted British merchant fleet was out-of-date and inadequate to meet post-war demands. Feverish activity in the shipyards produced new keels at appallingly high prices. Favourable conditions for seaborne trade, however, proved only a flash in the pan. A temporary boom was followed by a sharp slump in 1921.

By 1934 the position was desperate. The owners of tramp cargo-carriers were hardest hit, and a distressing spectacle was provided by the scores of tramp steamers and cargo liners rusting at their anchors in the estuaries around the British coasts. The companies owning passenger liners also suffered in the general depression of the 1930s, and endeavoured to bolster business by running holiday cruises. Not only were shipyard workers thrown out of work, but thousands of officers and men of the merchant service were among the unemployed.

The Second Great War

On the outbreak of the Second Great War in Sept., 1939, the merchant tonnage under the British flag was dangerously inadequate. Fortunately, there were about 8,000,000 tons of Allied, neutral, and enemy shipping in U.K. ports. Much of this was used to supplement the British merchant navy in its task of conveying troops, munitions, food, etc., while ship-building yards at home and overseas expanded their facilities for launching new keels.

Twice within 25 years the officers and men of the merchant navy faced the perils of enemy submarines, mines, and surface raiders and, in the Second Great War, hostile aircraft. Fewer ships were lost in the Second than in the First Great War, though, owing to the greater size of vessels, the tonnage lost was greater. In the Second Great War the convoy system was brought promptly into operation, and counter-measures against U-boats were more effective through the use of aircraft, radar, rockets, and other new inventions. Many merchant vessels also had their crews reinforced by highly trained personnel of the D.E.M.S. organization (Defensive Equipping of Merchant Ships).

Control was vested in the ministry of Shipping, later called the ministry of War Transport.

British merchant vessels (excluding fishing vessels) lost by enemy action during the Second Great War numbered 2,426 with a gross tonnage of 11,331,933. Of these 1,332 (7,595,645 gross tonnage) were destroyed by U-boats, 296 (816,255 gross tonnage) by mines, 209 (969,087 gross tonnage) by surface craft, 383 (1,575,230 gross tonnage) by aircraft, and 206 (375,716 gross tonnage) by other or unknown causes. Losses year by year were:

	No. of ships	Gross tonnage
1939 ..	96 ..	419,015
1940 ..	548 ..	2,435,667
1941 ..	717 ..	2,824,056
1942 ..	646 ..	3,459,923
1943 ..	273 ..	1,514,221
1944 ..	103 ..	489,040
1945 ..	43 ..	190,011

In addition, 136 fishing vessels (24,525 gross tonnage) were lost, 55 of them in 1941.

Deaths of seamen of all nationalities who served in British ships, and of British seamen who served in foreign ships chartered or requisitioned by the British government, from Sept. 3, 1939, to Aug. 31, 1945, totalled 29,180 in merchant, plus 814 in fishing vessels.

In both wars, the courage and skill of merchant navy officers and men in defensive action against the enemy, and their resolution in salvaging damaged ships, proved an important factor in reducing losses. Those who served under the red ensign retained status as civilians, but by special dispensation certain decorations for exceptional gallantry previously reserved for the military services, were awarded also to members of the merchant navy. Honours won in the Second Great War by members of the merchant navy and the fishing fleet totalled 8,449, among them five George Crosses.

As a result of the Second Great War, 109 enemy merchant vessels were added to the merchant navy. This figure covers dry cargo vessels and tankers of 500 gross tons and over, flying the British flag on July 31, 1947. Other ships were allocated but had not been transferred by that date.

Improving the Seaman's Lot

The claim that it needed two world wars to improve the lot of merchant seamen may appear a cynicism, but it is not without a strong foundation of truth. In the past, wages were on a parsimonious scale, and men had no guarantee of regular employment. The food was monotonous and poor, the accommodation in many ships deplorable. Much talk of "coffin ships" was heard during the 19th century, and the belief persists that there was an almost universal disregard of seafarers' interests. The truth is that from 1850 onwards, parliament appointed numerous commissions to inquire into mercantile marine affairs and passed many Acts with the object of improving conditions. Reputable shipowners, too, recognized the need for reforms.

Famous among Victorian agitators on behalf of merchant seamen is Samuel Plimsoll, a member of parliament and a landsman. His name and accomplishment are commemorated in the Plimsoll mark painted on the hull of every ship on Lloyd's Register; this mark indicates the lowest level to which the vessel can safely be sunk in the sea, and is intended to prevent overloading. J. Havelock Wilson, who founded the national sailors' and firemen's union in 1887, did much to improve wages, food, accommodation, and safety arrangements at sea. He it was who secured the introduction of trained cooks in all British ships except the smallest types. From his original organization developed

the exceedingly powerful National Union of Seamen.

Between 1890 and 1903 there was an increase of foreign seamen in British ships from 27,000 to 40,000, and a decrease of British of about 10,000. By 1912 there were 9,000 fewer foreign and 30,000 more British seamen. The estimated strength of the merchant navy in 1914 was 48,500 officers and 151,500 ratings, plus about 50,000 Indians, Chinese, and others. In 1919 there were 35,000 officers and 142,000 ratings, plus about 45,000 Indians, etc. In 1938 a census of employed seamen gave 27,020 officers and 87,111 ratings plus 45,182 Indians, etc. In 1947 the total strength of the merchant navy was estimated to be 41,000 officers and 84,000 ratings, plus approx. 35,000 Indians, Chinese, and others.

Seamen's Organizations

Through many decades British shipping has benefited by the institution of Lloyd's, and the board of Trade has acted as avuncular authority to the industry. Shipowners and their associations are represented by the Shipping Federation. The interests of shipmasters are represented by the Mercantile Marine Service Association, officers by the Navigators and Engineer Officers Union and the Radio Officers Union. These three organizations cooperate with each other, and with seven other British officers' organizations overseas, through the Officers' (Merchant Navy) Federation, which secured the introduction in 1938 of the M.N. Officers Pension Fund, to which shipowners and officers jointly contribute toward pensions payable at the age of 65.

Some improvements in sea-going conditions made voluntarily by the shipowners have been of a revolutionary nature. For example, the New Zealand Shipping co., in their refrigerated meatship *Hororata*, provides two and four-berth cabins amidships for its seamen. An air-conditioning system keeps the quarters warm in cold weather and cool in the tropics. The cabins have hand-basins with hot and cold water. The dining-saloons and mess-rooms radiate about a large galley where food is cooked by electric grills and ovens.

In 1947 a far-reaching agreement negotiated by the National Maritime Board on behalf of shipmasters, officers, ratings, and the shipowners was ratified; it included (1) standard rates of pay, that *e.g.* for an able seaman being

£20 per month in a ship where food is provided free; (2) the principle of a progressive wage with increased length of service; (3) the introduction of a scheme to make sea service a stable and continuous career; (4) the provision of leave with pay; (5) reduction of working hours in certain categories and increases in overtime pay.

Welfare Work

In bygone days the British mercantile marine recruited many fine, adventurous youths, but was regarded also as a refuse dump for misfits and delinquents. That phase is over. Recruits are selected with care and many enter from training-ships and sea schools. There was a time, too, when a sailor's well-being ashore was heeded by few save well meaning members of Christian missions. But tea and tracts, however generously provided, still left much to be desired. The establishment of the Seamen's Welfare Board early in the Second Great War led to the introduction of many amenities for seafarers ashore. The ministry of War Transport sponsored clubs and canteens overseas. Religious organizations and other voluntary bodies did much good and highly appreciated work in providing comforts and recreational centres.

Residential and non-residential clubs, etc., for men of the Merchant Navy include the former Bedford Head hotel in London; the Henry Radcliffe convalescent home in Surrey; Springbok village, Surrey, acquired by funds subscribed mainly in S. Africa, for retired and disabled seamen. The Seafarers' Education Service provides libraries in ships, and its associated college conducts courses by correspondence in English literature, modern languages, music, astronomy, etc.

Bibliography. History of Merchant Shipping, W. S. Lindsay, 1874; The Nation's Key Men W. H. Coombs, 1926; Century of Atlantic Travel, F. C. Bowen, 1932; British Shipping, R. H. Thornton, 1939; H.M. Merchant Navy, ed. E. C. Talbot-Booth, R.N.R., 1944; Ocean Odyssey, W. E. Stanton-Hope, 1944, Seafood Ships, A. C. Hardy, 1947; and publications issued by H.M.S.O.

Merchant of Venice, THE. Romantic comedy by Shakespeare. The chief character is the Jew, Shylock, who demands from Antonio, a merchant, a pound of flesh in forfeiture of a debt of money. The central scene is the trial in which Portia, disguised as

a doctor of law, turns the tables on the Jew.

This play was first published in quarto in 1600. A second quarto that year provided the text for the 1623 folio. Other quartos were issued in 1637 and 1652. Mentioned by Meres in 1598, parts of the story are found in the *Gesta Romanorum*, partly Englished by Robinson in 1577; The Adventures of Giannetto in Giovanni Fiorentino's *Il Pecorone*, 1378, first published 1558; The Orator of Alexandre Silvayn, Englished by Munday, 1596; Robert Wilson's play, *The Three Ladies of London*, 1584; and two old ballads, *Gernutus a Jew* (in Percy's *Reliques*) and *The Northern Lord*, quoted by W. C. Hazlitt in Shakespeare's Library.

The rôle of Shylock was once acted as a low comedy part. Now it is usually assumed that the speech "Hath not a Jew eyes?" etc., represents a plea for recognition of the dignity of all men irrespective of race. Of modern interpretations of the character the most idealised was by Henry Irving, at The Lyceum, 1879, when Ellen Terry was Portia. The play contains 2,705 lines, including 673 prose, 1,896 blank verse, and 93 pentametric rhymes.

Merchant Shipping Acts.

Statutes regulating various matters connected with the mercantile marine. In Great Britain the Merchant Shipping Act, 1894, is a statute of 748 sections and several appendices or schedules. It has been modified by later Acts.

These are intended to be a code of sea-law, and apply to a large number of subjects. Among these are: the registration of British ships, their transfer on sale or mortgage, their names, and the general liability of owners; the national character and flag; measurements and tonnage; the engagements, rights, duties, rating, pay, privileges, feeding, and sleeping of masters and seamen; volunteering into the navy; discipline on board ship; the regulation of passenger and emigrant ships; the carriage of dangerous goods, cattle, and military stores; overloading; passengers' contracts; fishing-boats, their registry; pay and discipline of fishermen and apprentices; certain apprenticeship agreements; special provisions as to trawlers; "rules of the road" at sea, and collisions generally; life-saving appliances; penalties for and prevention of sending unseaworthy ships to sea; the "survey" of ships; the limitation of a

ship-owner's liability for damage to goods; wreck and salvage; lighthouses; pilots and pilotage.

As for seamen, the object of the acts is to secure for them just treatment, protection from "crimps" and others who prey upon them, and the prevention of such atrocities as leaving seamen sick and stranded on foreign shores. The acts also try to prevent the provision of rotten tackle and other practices dangerous to the life of the sailor. As the result of international conventions acts have been passed to secure uniformity in the laws of the world relating to shipping.

Merchants' Marks. Term used in heraldry. From remote antiquity individual and associated merchants adopted marks to distinguish their goods. In time these were engraved on seals in a similar way to the badges, crests, and other insignia of knights and squires. In the 16th and the early 17th century many rich merchants impaled shields bearing their marks with the arms of their wives, others quartered them with armorial bearings, and so a number of such marks were adopted as heraldic charges. According to heralds such marks could be placed only on round shields; but the court of chivalry failed to enforce this ruling.

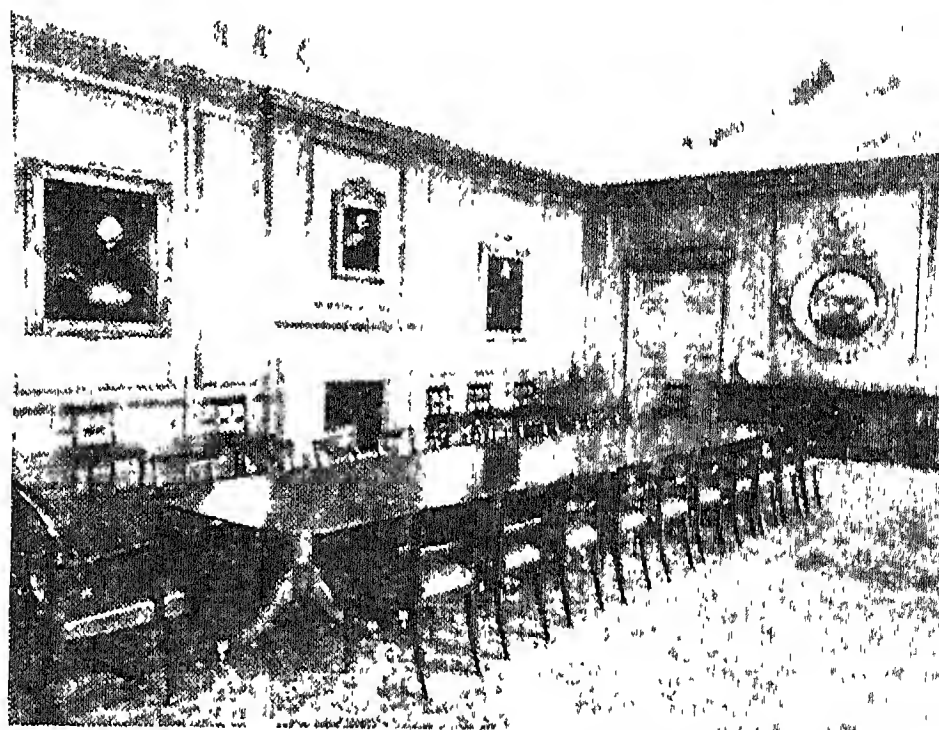
Merchant Taylors' Company. One of the 12 great livery companies of the City of London, ranking sixth and seventh in order of precedence in alternate years with the Skinners' Company.



Merchant Taylors' Company arms

Originally a religious and social fraternity, it received the first of its numerous charters from Edward III in 1327; it was reconstituted by a charter of 1503 under its present style of Gild of Merchant Taylors of the Fraternity of St. John Baptist in the City of London. In the course of time the interests of the members spread into wider spheres of commerce and the association with the tailoring trade almost ended in the 17th century. Arms were first granted in 1480; a new grant was made in 1586. It contributed to the plantation in Ulster in 1609 and to the early colonisation of Virginia. The site of the hall in Threadneedle St. was purchased in 1347, and the hall was built shortly afterwards. The crypt of a chapel built in 1399 exists, and the

kitchen built in 1425 is still in use. Rebuilt after the fire of 1666 and reconstructed during the 19th century, the hall was gutted by German bombing from the air on the night of Sept. 16-17, 1940; rebuilding started in 1957. The company founded Merchant Taylors' School (*v.l.*) in 1561. Among its many charitable activities, it maintains two sets of almshouses at Lee in Kent. It is patron of the livings of St. Helen's, Bishopsgate, and of



Merchant Taylors' Company, London. The Great Parlour, restored 1952-53, of the company's hall

St. Peter's, Limehouse. The company granted an annuity to John Stow, the antiquary, and restored his monument in the church of St. Andrew Undershaft. Consult Memorials of the Guild of Merchant Taylors, Clode, 1875; Early History of the Guild of Merchant Taylors, Clode, 1888.

Merchant Taylors' School. English public school. Founded in Suffolk Lane, Upper Thames Street, London, in 1561, by the Merchant Taylors' Company, it was removed to Charterhouse Sq., E.C., 1873-75, and to Sandy Lodge, Northwood, Middlesex, in 1933. It is a day school for about 500 boys, with a boarding house accommodating 56, and its governors from the first have been members of the company. It is divided into classical, modern, and scientific sides, and has valuable scholarships to St. John's College, Oxford, and Pembroke College, Cambridge. Spenser, Archbishop Juxon, Olive, John Walter (founder of The Times), Gilbert Murray, and James Jeans are among those educated at the school.

Merchant Taylors' School, CROSBY, LANCS. School founded in 1618 by a London merchant taylor. It was controlled by the Merchant Taylors' Company until 1940 when it passed to the control of a local board of governors which includes

representatives of the universities and the old boys' association. New buildings erected in 1878 were enlarged in 1913 and 1950-56. It is chiefly a day school, with accommodation for about 650.

Merchiston Castle School. A public school in Edinburgh. Founded in 1833, it was a private undertaking until 1896, when it was placed under a board of governors. Merchiston Castle, 15th-century, where the school was housed 1833-1930, was the residence of Napier, inventor of logarithms. The school was moved in 1930 to new buildings on a 90-acre estate bought in 1924. There is accommodation for some 250 boarders, and a few day-boys.

Edinburgh corporation bought Merchiston castle in 1930, and in 1958 planned to restore it for use as the offices of a proposed new technical college to be called Napier College.

Mercia. Kingdom of England in Anglo-Saxon times. The word means the march land. At first consisting of present-day Derby, Stafford, Warwick, Nottingham, and Leicester, it increased to contain everything between Thames and Humber, including London, except East Anglia. Lichfield, Tamworth, and Repton were its chief towns. It came into existence about 582. At first subject to Northumbria, in the 7th century, under Penda, it became independent, and other kingdoms were brought under its authority, making it the leading state in the land. Then it declined, until Ethelbald and Offa restored it to pre-eminence. After Offa's death in 796 his successors were vassals of the Wessex kings. Mercia was conquered by Egbert in 825. Its sub-kings were ultimately replaced by earls.

Mercié, (MARIE JEAN) ANTONIN (1845-1916). French sculptor. Born at Toulouse, Oct. 30, 1845, he was a pupil of Jouffroy and Falguière at the Ecole des Beaux Arts in Paris. In 1868 he gained the Grand Prix de Rome; and in the same year the Salon first accepted a work of his. His chief sculptures are the group Gloria Victis in Montholon Square,

Paris, 1874: the bronze group in high relief, *Le Génie des Arts*, at one of the gates of the Louvre, 1877; *Le Souvenir* on the tomb of Mme. Charles Ferry at Thann, Alsace; *Quand Même* in the Tuileries Gardens, Paris; and monuments to Bauery and Michelet in Père-Lachaise cemetery, Paris. He died Dec. 12, 1916.

Mercier, Désiré Joseph (1851-1926). Belgian prelate. Born at Braine-l'Alleud, Brabant, Nov. 21,



Cardinal Mercier,
Belgian prelate

1851, he was educated for the church at Malines, Paris, and Leipzig. Ordained in 1874, in 1906 he became archbishop of Malines and primate of

Belgium, and the following year was made a cardinal. After the German occupation of Belgium he was uncompromising in his championship of the rights of the Belgian people and his allegiance to the Belgian king, and the Germans imprisoned him in his residence. He died Jan. 23, 1926. His writings include *Les Origines de la Psychologie Contemporaine*, 1897; *Métaphysique Générale*, 1905. His War memories appeared 1920. Consult *Life*, J. A. Gade, 1934.

Mercury (Lat. *Mercurius*, from *merx*, gain). In Roman mythology the god of trade. He was the patron deity of the guild of Roman merchants. The Romans identified him with the Greek Hermes. See Caduceus; Flaxman, J.; Hermes.

Mercury. Nearest planet to the sun. It revolves round the sun at a mean distance of 36,010,000 m. in a period of 88 days. The closeness of the planet to the sun makes observation of it difficult, and many of the planet's data are uncertain. Schiaparelli and others have concluded from the permanency of its markings that the period of rotation about its own axis is the same as the period of rotation round the sun, so that it always presents the same face to the latter. This is confirmed by measurements of the temperature of its sunlit face, 770° F. The dark hemisphere must be almost at absolute zero, -459° F.

The orbit of the planet is extremely eccentric, with the result that on its nearest approach to the sun it receives more than twice as much heat as when it is at its greatest distance. The mass of the planet is one-twentieth that of

the earth, its density about three-quarters, and its diameter approximately 3,100 miles. It is improbable that Mercury has an atmosphere. Its orbit is subject to considerable perturbations, which early suggested the theory that there exists another planet between Mercury and the sun. Such a planet has not been found, however (see Intra-Mercurial Planet), and the observed effect is exactly accounted for by the theory of relativity, an accordance which has largely led to the acceptance of the theory. Mercury can be seen under favourable conditions shortly after sunset, or before sunrise, looking like a first magnitude star.

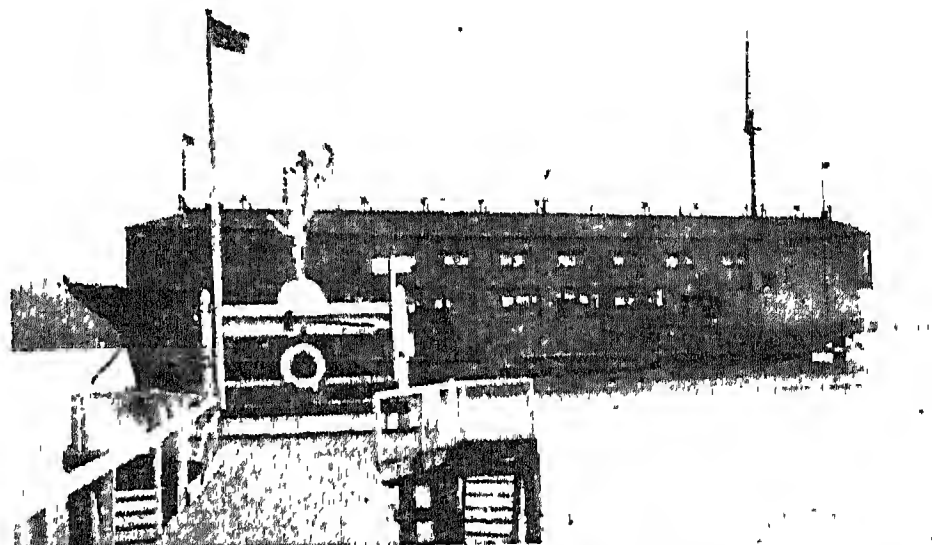
Mercury. British training ship. Lying at Hamble, Southampton, it was established in 1885 to prepare cadets for service as officers with the merchant navy. There is also an advanced class for those desirous of entering the Royal Navy. Commander C. B. Fry was honorary director 1908-50.

Mercury, or QUICKSILVER. Silver-white metal, the only metal which remains liquid at ordinary temperatures. Chemical symbol, Hg, lying at the end of the second group of the periodic table; atomic number, 80; atomic weight,

200.61; melting point, -38.5° C.; boiling point, 356.7° C.; density, 13.56 grams per c.c.; resistivity, 95.76 ohm cm. at 20° C. The crystal form of the solidified metal is simple rhombohedral.

It is not affected by air, oxygen, or carbonic acid at normal temperatures, but oxidised slowly when near boiling point. It dissolves readily in nitric acid and in hot sulphuric acid. It has a remarkable power of dissolving, or combining with, other metals without the aid of heat to form amalgams, some of which have high technical and commercial importance, e.g. in dentistry.

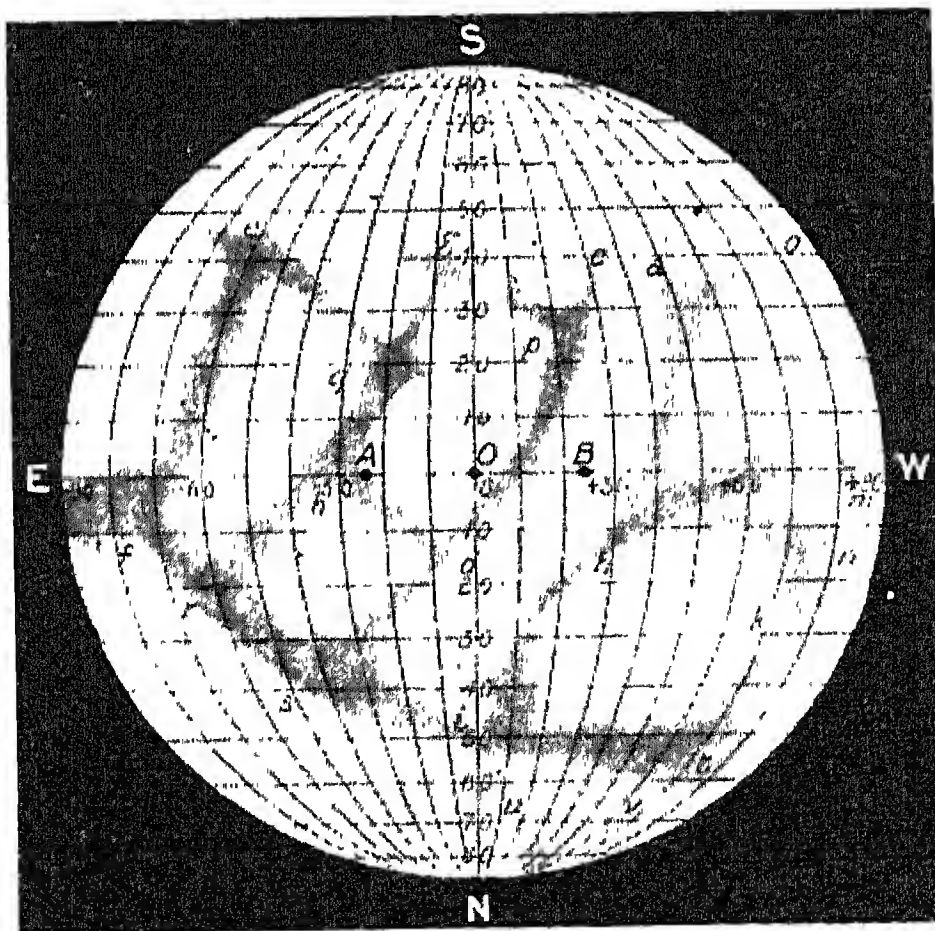
Mercury has been known for many centuries, having been regarded until the middle of the 18th cent. as an imperfect metal or



Mercury. British training ship, primarily for the merchant navy, lying at Hamble, Southampton

semi-metal. The Spanish mines were worked by the Greeks at least as early as 700 B.C. The medieval alchemists claimed the metal as a constituent, perhaps the vital principle, of all metals.

A little mercury is formed in nature as small globules in certain rocks, but virtually the whole of the world's production is obtained from cinnabar, or mercury sulphide, HgS. When pure this contains 86.2 per cent mercury and is bright red. It is deposited from hot aqueous solutions during periods of volcanic activity and found in fractured rocks of many types, mostly Tertiary, comparatively near the surface.



Mercury. Telescopic view of the planet, as seen by the Italian astronomer Schiaparelli, showing N. and S. poles, E. and W. points, degrees of latitude and longitude, the faint streaky markings *a b c... w*, and the points A B the outside limits of libration of longitude each side of the centre point O

At the present time cinnabar is being deposited from the hot springs in many volcanic regions.

The most productive and deepest mercury mine is that of Almaden (*q.v.*), in southern Spain, where work on veins has reached a depth of 1300 ft. in Silurian quartzes. Impregnations in shales and limestones are mined in Tuscany and near Trieste; and deposits are worked in California, the Ukraine, Mexico, Japan, Czecho-Slovakia, and elsewhere. Other ores occur in small quantities, *e.g.* horn quicksilver or calomel, a chloride; coccinite, the iodide; tiemannite, the selenide; coloradoite, a telluride; arguerite, native amalgam with silver (found in Chile); and other amalgams with silver, gold, and copper. None of these is as important as cinnabar.

Treatment of the Ores

Because of their low mercury content, ores usually have to be concentrated before treatment for recovery of the metal. This dressing of the ores is particularly important for mercury ores, as crushing normally produces large amounts of slime. The coarsely crushed ore is best treated by hand-picking at the mine, the rich mineral lumps being easily recognized by their red colour. The remaining ore is then classified into various sizes. High-grade mercury concentrates may be treated by volatilisation direct in retorts; but the coarse material is usually treated in shaft furnaces. Medium-coarse ore, pieces under $1\frac{1}{2}$ ins., may also be so treated, as in the U.S.A.; but in Europe, shelf or tile furnaces are preferred. The fine material is sometimes treated in reverberatory furnaces in Europe, but with modern improvements in flotation practice the fines and slimes are very often concentrated by this method. Cinnabar is now quite easily floated in solutions containing aerofloat and copper sulphate.

The mercury sulphide is only partially decomposed by heating alone or with carbon, so the sulphur is locked up, either by forming some other more stable sulphide or by oxidising it to SO_2 with air. The three chemical reactions available are the oxidation already mentioned, leaving mercury with the sulphur burned off; the formation of calcium sulphide and sulphate by heating with lime; or the formation of iron sulphide by heating with iron. Free mercury is liberated by each method.

All these reactions take place at temperatures above the boiling

point of mercury, and the mercury comes off as a vapour, which must subsequently be condensed to liquid metal by cooling. The first process, known as air reduction, is found to be the simplest in practice, although the presence of large amounts of gas, excess air, and dust results in the production of a considerable quantity of mercury dust or "stupp." This consists of fine globules of mercury so coated with dust that they will not coalesce. The product is therefore specially treated in modern plants by a mechanical extractor.

Types of Furnace

Processes are much the same all over the world, differences being chiefly in the design of furnaces and condensers. In modern practice there are two types, shaft furnace and reverberatory furnace. The latter, conventional in design, are used only for fine ore and for ores which decrepitate, *i.e.* burst into fine particles on heating. For coarse ores a straight shaft furnace is used, the most modern being a square vertical shaft of ordinary firebrick, with a bell arrangement for charging at the top and discharge plates for the spent ore at the bottom. The ore is mixed with 2-3 p.c. charcoal. This, with the sulphur in the ore itself, is sufficient fuel to raise the temperature to 800°C . For coarse, medium, and sometimes even fine ore, shaft furnaces with inclined shelves are everywhere replacing the older furnaces. Typical is one consisting of four rectangular shafts, fed from the same grate and each containing a series of tiles inclined at an angle of 45° . The ore slides down these tiles, being met by the hot gases from the grate, air for the fire being pre-heated by the hot spent ore. The ore must be dry or it sticks to the tiles. This drying is effected in rotary driers. Other variations are an intermediate between a reverberatory and a shaft furnace; the rotary kiln furnace; and furnaces with rotating rabbling-arms.

Very large condensing space is needed to collect all the mercury; for a furnace treating 50 tons of an ordinary ore 20,000 cu. ft. would be required. In America a series of large brickwork chambers is employed, while in Europe usually a number of stoneware tubes are used followed by chambers constructed of wood or glass (*see* Condenser). The fine dust may be removed by an electrostatic precipitator. A wet process is used in a few localities. Mercury is still used to some extent for the recovery of gold and silver from their

ores by amalgamation. It can be frozen into a solid, which can be hammered, rolled, or welded, like other metals. Forty p.c. of the world's production is used in the manufacture of drugs and chemicals, while the fulminate is used for making detonators. Large amounts are used by manufacturers of electrical apparatus, thermometers, barometers, and many other scientific instruments, and for floating the lanterns of lighthouses. Recently various solders containing mercury have been developed for joining galvanised iron, etc. Other users are the makers of vermilion, which is a mercuric sulphide, and of felt, caustic soda, and glacial acetic acid.

Compounds of Mercury

Two oxides of mercury are known, the black mercurous oxide, Hg_2O , and the red mercuric oxide, HgO , the latter being the substance used by Priestley in his original preparation of oxygen. The two chlorides are both white, but while one, mercurous chloride or calomel, Hg_2Cl_2 , is much used in medicine, the other, mercuric chloride, HgCl_2 , or corrosive sublimate, is extremely poisonous; it is used in surgery for disinfecting the skin. Mercurous iodide, Hg_2I_2 , is greenish yellow, and mercuric iodide, HgI_2 , is a brilliant scarlet, the latter being used in veterinary practice as a blistering agent. Various other compounds are used medically, *e.g.* mercuric salicylate for the treatment of "athlete's foot." In photography, mercuric iodide and perchloride may be used for intensification. Mercury in its metallic form was used to develop the image in the Daguerreotype process. *See* Calomel; Condensation; Corrosive Sublimate; Flotation; Fulminate of Mercury; Mersalyl; Metallurgy; Reverberatory Furnace; Wedge Roaster.

Mercury Theatre. London playhouse in Ladbroke Road, W.8. Opened by Ashley Dukes in 1933, it was launched on the strength of £10,000 which Dukes made by his play, *The Man with a Load of Mischief*. A parish hall and two adjoining houses were converted into a miniature theatre seating about 150. In 1935 T. S. Eliot's *Murder in the Cathedral* (*q.v.*) ran there for nine months. Experimental plays and revivals included *The Ascent of F6*, *The Playboy of the Western World*, and *Hedda Gabler*. Closed during the Second Great War, the Mercury was reopened in 1945 as a "poets' theatre," under the direction of Martin Browne, who put on *This Way to*

the Tomb, 'The Shadow Factory, Happy as Larry. The theatre was dismantled in 1954.

Mercutio. Character in Shakespeare's play *Romeo and Juliet* (*q.v.*). Kinsman to the prince of Verona, friend to Romeo, and a man of overflowing wit, fancy, and bawdy humour, he delivers the famous speech about the Fairy Queen Mab. He is killed in an encounter with Tybalt, Juliet's cousin, and is avenged by Romeo, who slays Tybalt.

Mercy. In a Scriptural sense, an attribute of God. Much discussion has arisen regarding the translation of the word from the Hebrew. It is variously interpreted as compassion, yearning, pity, kindness, benignity, or loving-kindness, and is associated with truth. The believer is taught to pray for it, that Divine justice may be tempered by it, and is enjoined to show it to others. It has an affinity with grace. Generally speaking, the assumption seems to be that it may be extended where punishment cannot be withheld, but where wrong-doing is mitigated by the possession of a record not wholly blameworthy. The expression Be merciful, Deut. 21, v. 8, and 32, v. 43, in the A.V. is rendered in the R.V. by the words Forgive and make expiation. The common meaning of the word is eloquently expressed in Portia's speech in *The Merchant of Venice*, Act IV, scene 1. See *Charity*.

Mercy, PREROGATIVE OF. In English law, the right of the crown to grant a pardon to a person who has committed a criminal offence. See *Pardon*.

Mercy, SISTERS OF. Religious order of women who devote themselves to active work for the good of the community, especially among the poor and sick. It was founded in 1831 by Mary Catherine McAuley in Dublin. The sisters differ from nuns in not being enclosed within their convents, but going about in the exercise of their work.



Sister of Mercy

All sisters of mercy take the three-fold vow of poverty, chastity, and obedience; some annually, and others for life. In the Church of England the terms Sisters

of Mercy is used in a general sense; but in the Church of Rome it is usually restricted to the congregation founded by Mother McAuley, who seems to have taken the name from an order of Sisters of Mercy started at Barcelona about 1265. This congregation adapted the rule of S. Augustine and devoted itself to the instruction of poor girls, the visitation of the sick, and the protection of distressed women of good character. It now has about 112 houses in England and about 215 in Ireland, with some 877 convents in the U.S.A. The mother house is in Baggot Street, Dublin; but each convent is run independently. There are 22,000 sisters.

Mer de Glace (Fr., Sea of Ice). Famous Alpine glacier of France,

in the dept. of Haute-Savoie, near Chamonix. Over 9 m. long, it descends from the N. slope of Mont Blanc by three branches, the Talèfre, the Tacul (or Géant), and the Lechaux glaciers. It almost reaches the river Arve, having accumulated a large moraine. Below the Montanvert it is called the Glacier des Bois. It is noted for its beautiful scenery. See *Glacier*.

Mere. Name for a lake, e.g. Windermere, Buttermere, and Thirlmere, all in the English Lake District, and the meres of Cheshire. These last have been formed by the dissolving of salt by underground water, and the collapses on the removal of the brine by springs or pumps. The meres are formed in the depressions caused by the subsidences of the overlying soil.

GEORGE MEREDITH: POET & NOVELIST

Sir John Hammerton, Author of *Meredith: His Life and Art*

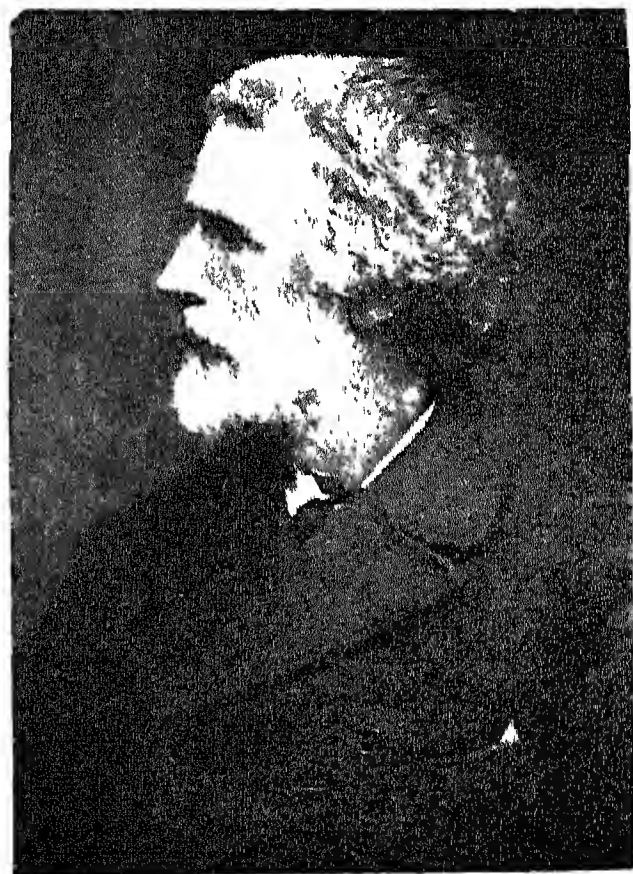
See articles on Meredith's works, e.g. *Ordeal of Richard Feverel*, *Egoist*; and those on Hardy, Kipling, and others of his contemporaries. See also *English Language and Literature*; *Novel*

George Meredith was born Feb. 12, 1828, at 73, High Street, Portsmouth, of mixed Welsh and Irish parentage. His father was Augustus Armstrong Meredith, a naval outfitter, and his mother Jane, daughter of Michael Maenamarra of the same town. He received his early schooling at Portsmouth, and at 14 was sent to the Moravian school at Neuwied on the Rhine, where he stayed for two years. Returning to London, he was articled to a city solicitor of literary tastes, but before he was 21 he had abandoned the law and turned to letters, his first and quite unpromising poem, *Chillianwallah*, appearing in *Chambers's Journal*, July 7, 1849.

On Aug. 9 Meredith married Mary Ellen Nicholls, nine years his senior, widow of a naval officer and daughter of Thomas Love Peacock. In 1851 he published *Poems*, the remarkable quality of which was recognized by Kingsley and by Tennyson, who went about declaiming the haunting stanzas of that masterpiece, *Love in the Valley*; in 1856 a fantastic and fascinating Oriental tale, *The Shaving of Shagpat*, was warmly welcomed by George Eliot and other competent critics; and in 1857 another, though less remarkable, fantastic tale, *Farina: a Legend of Cologne*, was inspired by his residence in Rhineland.

Of Meredith's activities between his marriage and the publication of *Shagpat* little or nothing is

known. He was not yet able to make a living by his pen, and a shadow was deepening on his home.



George Meredith

But in 1856 he secured regular journalistic work as absentee editor of *The Ipswich Journal*, writing his leading articles and news paragraphs at his Weybridge home, and continued this connexion for some years, also contributing to *The Morning Post*, edited by his friend, Sir William Hardman. In 1858 Meredith and his wife separated, he and the only child of the marriage, Arthur, going to live at Copsham Cottage, between Esher and Oxshott.

The Ordeal of Richard Feverel 1859, won the author new friends among those who could discern great work unguided, but far from gaining him a popular success, it was decried for its impropriety and even preached against from the pulpit: not then, as a generation later, a valuable form of advertisement. In 1861 Mrs. Meredith died, and after serial appearance in *Once a Week* there was published *Evan Harrington*, a masterly novel, in which the author gives a fictional study of members of that Portsmouth tailor's family whence he sprang, and exhibits certain aspects of English snobbery that make it a true mirror of its time. *Modern Love* and *Other Poems*, 1862, gave fulfilment of the rich promise of the earlier *Poems*; the title-poem, or sequence of caudated sonnets, *i.e.* with two or three extra lines, belongs to the best poetry of its age.

Meredith, who had now become literary adviser to the house of Chapman and Hall, a post he filled for some 30 years, married in 1864 Marie Vulliamy and found happiness. In the same year he published *Emilia in England*, later to be renamed *Sandra Belloni*. *Rhoda Fleming*, a tragic story and the most simply told of all his novels, followed in 1865. In 1866 he acted as correspondent in Italy for the *Morning Post* during the Austro-Italian War, and the next year published *Vittoria*, his fine sequel to *Sandra Belloni*, fresh with the local colour derived from his Italian sojourn. In 1868 he settled at Flint Cottage, Box Hill, Surrey, his home for the rest of his life. In 1871 came the vigorous and splendid romance *The Adventures of Harry Richmond*; in 1876 *Beauchamp's Career*; and in 1879 that masterpiece of character-study, *The Egoist*—a succession of great novels that consolidated their author's international fame, though they did not yet bring him that wide popularity which is based upon the mass of the novel-devouring public.

Meredith was now accepted by the real critics of literature as one of England's foremost men of letters in an age of great writers. *The Tragic Comedians*, 1880, was a fictional rendering of the story of Ferdinand Lassalle and Helene von Dönniges, the qualified success of which indicates a novelist somewhat ill at ease with history. After *Poems* and *Lyrics of the Joy of Earth*, 1883, including some of the finest of his nature poetry, there came *Diana of the Crossways*,

1885, the novel that caused a sudden widening of the public interest in Meredith's work, largely perhaps because of gossip about its being a romance with a key, and the association of its heroine with Caroline Norton.

In the year of this long-delayed recognition his happy married life ended, for Mrs. Meredith died Sept. 17. Later books were *Ballads and Poems of Tragic Life*, 1887; *A Reading of Earth*, 1888, poems which include the beautiful *A Faith on Trial*; *One of Our Conquerors*, 1891; *Lord Ormont and his Aminta*, 1894; and *The Amazing Marriage*, 1895, the last three of his novels, wherein the peculiarities of his style were somewhat accentuated. In 1905 Meredith received the Order of Merit. The 70th and 80th anniversaries of his birth were made occasions for cordial tributes of appreciation and homage. On May 18, 1909, he died at Box Hill, and after cremation his ashes were laid in the graveyard at Dorking. Meredith will assuredly remain articulate as one of England's greatest poetical interpreters of Nature, but his novels, both in style and construction, carry such defects of their qualities as may deny them the enduring classic fame their content deserves. He was by incidence of time one of the greatest Victorians, though intellectually his real kinship lay with the age of Fielding.

Bibliography. George Meredith: *Some Characteristics*, R. Le Gallienne, 5th ed. 1900; *The Poetry and Philosophy of G. M.*, G. M. Trevelyan, 1906; *G. M.: His Life and Art*, Sir John Hammerton, 1909; *Meredith's Allegory, The Shaving of Shagpat*, J. McKechnie, 1910; *Letters* ed. by his son, 1912; *G. M., from the French of C. Photiades*, A. Price, 1913; *G. M. (English Men of Letters)*, J. B. Priestley, 1926; *Mr. Meredith*, S. Sassoon, 1948.

Meredith, OWEN. Pseudonym of Edward Robert Bulwer Lytton, 1st earl of Lytton (*q.v.*).

Meredith, WILLIAM. Welsh footballer. An inside forward for Manchester City and Manchester United, he made 51 appearances for Wales in international matches. In 1895, his first year in international football, Meredith played in three such matches in eight days; he last represented Wales in 1920.

Merejkowski, DMITRI SERGEIEVITCH (1865–1941). Russian novelist, poet, and critic. Born at St. Petersburg, Aug. 2, 1865, he came into prominence with *The Causes of Decadence in Modern Russian Literature*, 1893, in which

he saw a remedy in the study of the French symbolists. His greatest work is the trilogy *Christ and Anti-Christ*, consisting of *The Death of the Gods*, or *Julian the Apostate*, 1901; *The Forerunner*, or *Leonardo da Vinci*, 1902; and *Peter and Alexis*, 1905.

The *S. Merejkowsky* whole has been translated into English. Among his other works were plays about Paul I, 1908, and Alexander I, 1913; *Fourteenth of December*, 1920; *Napoleon*, 1928. An anti-Bolshevik, he left Russia in 1919, living in Poland, then in Paris, where his death was reported in Dec., 1941. Merejkowski married Zinaida Nikolayevna Hippus (1869–1945), poet and critic, who wrote under the name Anton Kravny.

Merenptah. Egyptian king of the XIXth dynasty, c. 1225 B.C., also spelled Merneptah and Mineptah. The 13th son and successor of Rameses II, he was regarded by Alexandrian tradition as the pharaoh of the Exodus. On a stela found at Thebes, in 1896, recording his Libyan victories in his fifth year, are the words "Israel is desolate, its seed is not," only known Egyptian record of the name Israel.

Meres, FRANCIS (1565–1647) English divine, author, and translator. A graduate of Pembroke College, Cambridge, professor of rhetoric at Oxford, and later rector and schoolmaster at Wing, Rutland, he is chiefly remembered as the author of *Palladis Tamia: Wit's Treasury*, 1598, in which the literature of his period is compared with that of Greece and Rome, and the most important contemporary account is given of Shakespeare's works up to that year.

Merganser (Lat. *mergus*, diver; *anser*, goose). Genus of marine diving ducks, including about six



Merganser. Hooded species of marine duck

species distinguished by their extremely narrow beaks, furnished with saw-like teeth. Three species occur regularly in the British

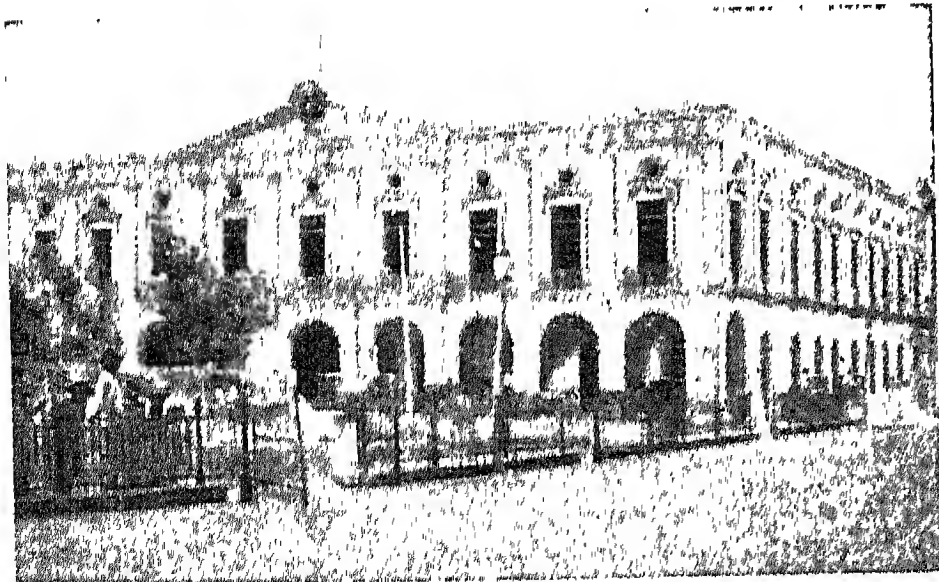
Islands. Of these the goosander (*M. merganser*) is the largest and has a glossy, green head and neck, black back, white wings, and ashy grey under-parts. It is common on the W. coast of Scotland and breeds in the Highlands, but visits England and Ireland only in severe weather. Although it spends most of its time at sea, it constructs its nest in hollow trees.

The red-breasted merganser (*M. serrator*) is a handsome bird, distinguished by the crested head and the pale chestnut colour of the lower neck and breast. It is a resident of the Highlands of Scotland and of the Orkneys, Shetlands, Hebrides, and Ireland, and in winter visits the coasts farther S. It is usually found in flocks, and feeds on small fishes, crustaceans, and molluscs. The smew (*M. albellus*) is a rare visitor; as is the hooded merganser (*M. cucullatus*) from N. America.

Mergenthaler, OTTMAR (1854-99). A German-born American inventor. Born in Württemberg, Nov. 10, 1854, he became a watchmaker, and in 1872 emigrated to the U.S.A. where he set up in Baltimore as a precision engineer. In 1886 he invented the first practical linotype machine, so revolutionising printing.

Mergui. Port and district of Burma, in Tenasserim division. The port is a minor harbour on the narrow coast strip of Tenasserim, with a trade in rice, pearls, and edible birds' nests. The existing town is modern, built on the site of an ancient city. The district contains tin. Rice, sugar-cane, sesamum, and tobacco are grown; tropical fruits are supplied to Rangoon and Moulmein. Pop. dist. 180,827; town, 25,000.

Mergui Archipelago. Group of hundreds of small islands off the Tenasserim coast, Burma. Most of the islets are rocky, composed of granite or sandstone. The native Selungs exchange edible birds' nests and bêche de mer for rice.

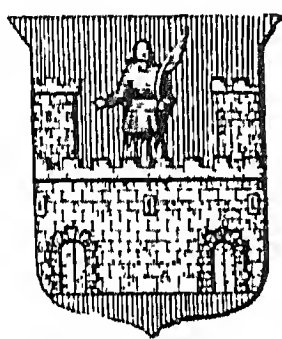


Mérida, Mexico. The Governor's palace

Mérida (anc. *Augusta Emerita*). Town of Spain, an important rly. junction in the prov. of Badajoz. It stands on the river Guadiana, 40 m. by rly E. of Badajoz. It was the capital of Lusitania and has more Roman remains than any other Spanish city, including a fine stone bridge of 60 arches, 2,670 ft. long, built in the time of Augustus or Trajan; the ruins of a three tier aqueduct 85 ft high; crumbling walls and gates; a triumphal arch, a theatre, an amphitheatre, temples, etc. Pop. (1951) 23,835

Founded in 25 B.C., Mérida became a city of great splendour. It fell into the hands of the Moors A.D. 712. Its archbishopric, dating from Visigothic times, was transferred in 1129 to Santiago, to whose knights it was entrusted on its capture from the Moors in 1228.

Mérida. City of Mexico. The capital of the state of Yucatan, it is a well-built city, with wide streets and many open spaces, and is connected by rly. with Progreso 24 m. to the N. on the Gulf of Mexico, and by air with the capital and the U.S.A. The seat of a university, with



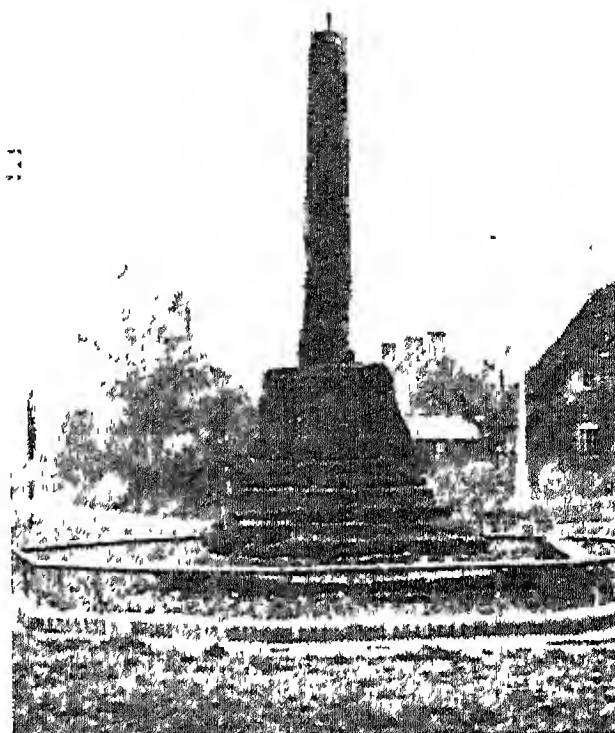
Mérida, Mexico. arms

law, medicine, and other faculties, it has a cathedral dating from 1598, a 16th century Franciscan convent, the bishop's palace, a government palace, and a museum. Cotton and sisal, straw hats, cigars, leather, and soap are manufactured. The city, which was founded in 1542, became the seat of a bishopric in 1561. Pop. (1950) 142,838.

Mérida. City and state of Venezuela. The city stands on the Chama, 310 m. S.W. of Caracas. It has a cathedral, seat of an archbishop, and university. It was founded by the Spaniards in 1558, partly destroyed by earthquakes in 1812 and in 1894, and rapidly recovered.

Mérida state has an area of 4,400 sq. m., most of which is occupied by the branch of the E. Andes called the Cordillera de Mérida. It was created a state in 1901. Cocoa is cultivated. Pop. (1950) 211,110.

Meriden. Village of Warwickshire, England. It is 5½ m. W.N.W. of Coventry and is regarded as the centre of England. Remains



Meriden, Warwickshire. The cross which was believed to mark the centre of England

of a cross erected to mark what was believed to be the exact spot were moved out of the roadway in 1952. An obelisk of Cornish granite as a memorial to cyclists who fell in the First Great War was subscribed for by nearly 30,000 cyclists from all over Great Britain.

Meriden. City of Connecticut, U.S.A., in New Haven co. Situated almost equidistant from Hartford and New Haven, it is served by the New York, New Haven, and Hartford rly. It contains the Curtis Memorial Library, and among its institutions is the Connecticut school for boys. The International Silver co. here is widely known as a manufacturer of silver ware. Other metal products are also made. Near by is Hubbard Park, a natural reservation of 900 acres, in which the Hanging Hills, 1,000 ft. high, are said to have inspired Gerhart Hauptmann's *The Sunken Bell*. Formerly part of Wallingford, Meriden was incorporated in 1806, and became a city in 1867. Pop. (1950) 44,088.

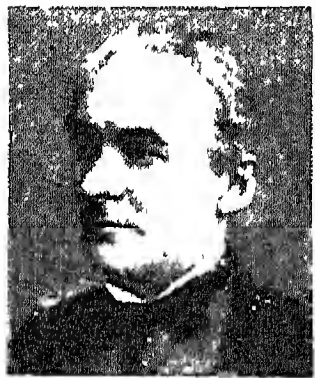
Meridian (Lat. *meridies*, mid-day). In astronomy, the great circle of the heavens passing through zenith of any place and the N. and S. poles of the celestial sphere. A terrestrial meridian is the line of intersection of the earth's surface with a plane passing through the poles. The magnetic meridian at any place on the earth's surface is the direction along which a horizontally suspended compass

needle points when influenced only by the earth's magnetism. See Longitude: Transit Circle.

Meridian. City of Mississippi, U.S.A., the co. seat of Lauderdale co. Situated 95 m. E. of Jackson, and served by the Alabama Great Southern and other rlys., it has several educational institutions, and the East Mississippi Hospital for the Insane. The most important manufacturing city in the state, its lumber mills cut 35,000 ft. of hardwood daily, and its stockyards are able to accommodate 5,000 head of cattle. Founded in 1854, Meridian became a city in 1860. Four years later it was occupied by a Federal force, which demolished the rly. tracks and most of the buildings. In 1906 great damage was done by a tornado. Pop. (1950) 41,893.

Merim. Variant spelling of Mirim (q.v.), the name of a lake in S. America.

Mérimée, PROSPER (1803-70). French author. Born in Paris, Sept. 28, 1803, he was educated for



the bar but entered the civil service, and became a senator in 1853. He began his literary career with two clever mystifications, *Le Théâtre de Clara Gazul*, 1825; and *Guzla*, 1827, which he published as translations respectively of the plays of a Spanish actress and some Illyrian folk-songs. These he followed with an historical novel, *Chronique du Règne de Charles IX.* He is at his best, however, in his shorter tales, some of which are masterpieces. By far the best known of these is *Carmen*, on which Bizet based his opera. He also did some excellent work in history, e.g. *Les Faux Démétrius*, 1852. His *Lettres à Une Inconnue* throw an interesting light upon his enigmatical character. A man of a melancholy, sceptical, and sensitive temper, and endowed with a powerful intellect, he was a subtle and scholarly writer, and one of the greatest masters of imaginative prose in the 19th century. Consult *Prosper Mérimée: a Mask and a Face*, G. H. Johnstone, 1927.

Meringue. Confection of whites of eggs whipped to a froth and powdered sugar in the proportion of ten or twelve eggs to 1 lb. of sugar, and baked till fawn in colour. The result is a light, brittle sub-

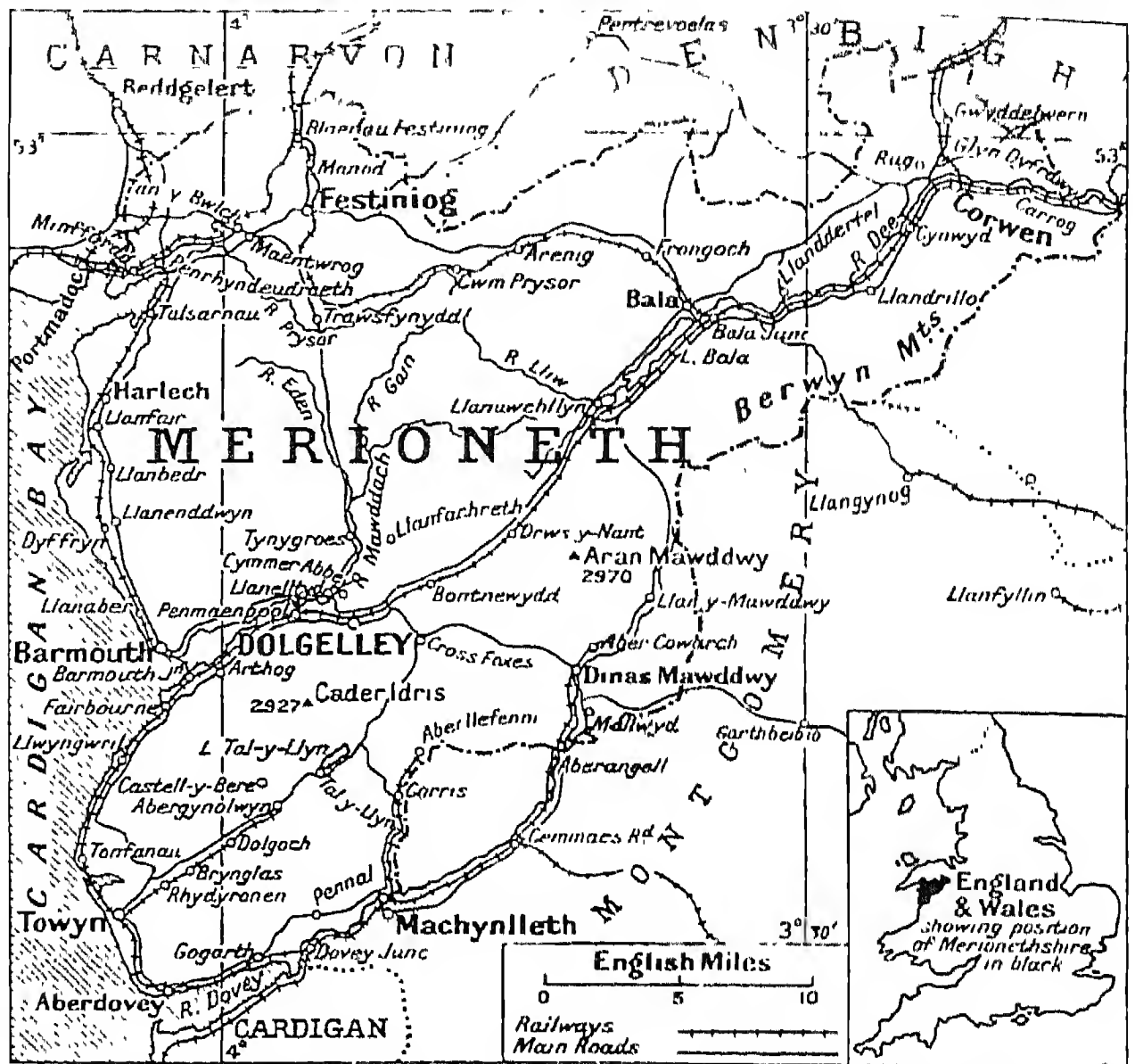
stance which may be served with whipped cream. Meringue is often used as a garnish for puddings and pastry. The name is explained as a variant of Marengo, in honour of which victory the confection was invented by Napoleon's cook.

Merino. Originally the Spanish name for a breed of sheep with exceptionally fine white wool. It has been bred in many parts of the world. In the textile trade the term now has various meanings: (1) the finest wools, whether from sheep as above or from more modern inter-breedings which have wool of a similar quality; (2) Merino yarn, used for shirtings and hosiery, containing fine wool and cotton in various proportions, commonly 50 p.c. of each; (3) a dress fabric containing merino wool, and woven in a twill weave.

Merionethshire. County of N. Wales. It derives its name from Meirion, a grandson of prince Cunedda (5th century). It has a coastline of 38 m. on Cardigan Bay, rugged mountains, beautiful valleys, and waterfalls. The highest summits are Aran Mawddwy, 2,970 ft., and Cader Idris, 2,927 ft.; a number of others are over 2,000 ft. high. The county has



Merionethshire arms



Merionethshire. Map of this maritime county of North Wales

many lakes, the largest being Bala and Tal-y-llyn; principal rivers are the Dee, Mawddach, and Dovey. The soil is not of very high quality except in the valleys; sheep and cattle are reared. Other industries are slate quarrying, forestry, and catering for visitors. The county forms a co. constituency. Dolgelley is the co. town; at Harlech, formerly the co. town, there is an old castle. Other towns are Blaenau Festiniog, Barmouth, Towyn, Corwen, Bala. Castelly-Bere has a ruined castle; Cymer Abbey, at Llanelltyd, is the ruin of an old Cistercian foundation. Corwen was Owen Glendower's h.q. Area 660 sq. m., three-quarters in Snowdonia national park. Pop. (1951) 41,465.

Meristems. Botanical term. It is applied to tissues of plants in which growth and multiplication of cells is pronounced, in contrast to permanent tissues the elements of which have ceased to grow and are generally no longer capable of division. Promeristems consist of thin walled cells, often hexagonal prisms in shape. They have large nuclei and abundant cytoplasm in which there are usually many small vacuoles. They are especially readily seen in sections of root tips or of the apical cone from within a bud. By their repeated division, mainly in a direction across the organ in which they are found, they add cells to its length. They also initiate by their outgrowth the

origin of leaves and buds from the stem apex and arise in the pericycle of roots to form new root apices for lateral root branches. The youngest promeristem cells are usually nearest the apical cone. Other older meristem cells further away from this show fewer and larger vacuoles and with distance approximate in shape to the permanent tissue elements into which they are destined to change. These considerably vacuolated but not yet mature cells are histogen cells, and together with the promeristems constitute the apical meristems by virtue of their position and are primary meristems since upon their activity the primary development of the plant body is due. Sometimes a small proportion of apical meristem cells retain their meristematic capacity for growth and division after their neighbours have become converted into permanent tissue. There may be left transverse plates of intercalary meristem, *e.g.* at the bottoms of iris leaves and below the nodes of some mints, or longitudinal strips of primary cambium such as are common in the vascular bundles of dicotyledon stems. Other cambia are secondary since they are not derived directly from apical meristem.

Merit, ORDER OF. British order for distinguished service in all callings. It was founded by



Order of Merit. British badge (military) in its centre on a blue medallion, surrounded by a laurel wreath, the words For Merit, and on the reverse the royal cypher. Crossed swords are added for naval and military members. Appointment to the order is made personally by the sovereign, who can bestow it without ministerial advice. It is limited to 24 members.

Membership is normally conferred on subjects of the crown for exceptional services to the British Commonwealth, or to art, literature, or science. Although designed as a special distinction, it confers no precedence and carries no title. Among members have been Sir Charles Sherrington, G. M.

Trevelyan, John Masefield, Ralph Vaughan Williams, Lord Chetwode, Lord Chatfield, Lord Newall, Gilbert Murray, Augustus John, Sir Henry Dale, Sir Giles Scott, Winston Churchill, Lord Portal, Lord Alanbrooke, Lord Cunningham, Lord Halifax, J. C. Smuts, W. L. Mackenzie King, and T. S. Eliot. General (later President) Eisenhower was made an honorary member in 1945. Florence Nightingale was the only woman member.

Merit, ORDER OF. Decoration awarded in various countries for distinguished service in various callings. The Indian Order of Merit was instituted in 1837 for native officers and soldiers; the ribbon is blue with red edges. The Prussian, later German, order Pour le Mérite for military merit was instituted in 1740; the badge was a Maltese cross, having on the upper arm the letter "F," on the others the words "Pour le Mérite"; the higher grade had a wreath of oak leaves added; the ribbon was black with white stripes.

The Order of Merit in Arts and Sciences was instituted by Frederick William IV of Prussia in honour of Frederick II; the badge was a golden Prussian eagle on a white medallion, and the ribbon was white edged with black. The Russian order, instituted in 1792, was remodelled in 1807; the badge was a black cross pattée concave, and the ribbon was dark blue with black stripes. The Spanish military Order of Merit was instituted in 1864. The Order of Merit at Sea, founded in 1866, has the same badge, while the ribbon is blue with white border. There are also the Alphonso XII Order of Merit for Science, Literature, and Art, and the Alphonso XII Civil Order of Merit, both founded by Alphonso XIII in 1902. The Savoy military Order of Merit was founded in 1815, and revised by Victor Emanuel in 1855; Italy also has the civil Order of Merit of Savoy, founded in 1831.

Meritorious Service Medal. British decoration awarded to men of the army, navy, and air force. The first award for gallantry for other ranks, it was instituted for army sergeants in 1845 and for marines in 1849. It had the head of Queen Victoria on the obverse, and a laurel wreath, within which was the inscription "For Meritorious Service," on the reverse. The ribbon was deep red for the army and deep blue for the navy. It fell into abeyance about the time of the Crimean War, and was revived

in 1884, when it was extended to all soldiers above the rank of corporal. In 1916 it was thrown open to the lower ranks of the army, navy, and R.A.F. The present ribbon for the army is crimson with a narrow edging and narrow central stripe of white; for the navy, crimson with three white stripes; and for the R.A.F., a ribbon with narrow white edges, a white central stripe, a band of deep blue between the left edge and the centre, and a crimson band between the centre and right edge.



Meritorious Service Medal (army)

Merivale, CHARLES (1808-93). British historian. Born March 8, 1808, he was educated at Harrow, Haileybury, and St. John's, Cambridge, where he had a distinguished academic career, and was a noted athlete, rowing in the first university boat race in 1829. He became dean of Ely in 1869.

His *History of the Romans under the Empire, 1850-1862*, is his greatest work. The *Fall of the Roman Republic, 1853*, is a popular epitome of a section of it, and *The General History of Rome from the beginning to the fall of the Western Empire, 1875*, is a summary. He died Dec. 27, 1893.

Merlin. Type of aero-engine designed by Rolls-Royce, Ltd. It was used extensively in the Second Great War and was in the liquid-cooled 12-cylinder Vee class. The power was progressively increased from the 1,020 h.p. of the Mark I in 1939 to the 2,080 h.p. of the Series 140 (1946). Aircraft, both fighting and civil, fitted with the Merlin included the Hurricane, Spitfire, and Mustang (single-engined), Mosquito (twin-engined), and Halifax, Lancaster, York, and Tudor (four-engined). See *Aero-Engines*, illus., p. 119.

Merlin (*Falco columbarius*). Smallest of the British falcons. It is greyish blue on the upper parts, the male being pale yellow spotted with brown on the under parts; and the female brownish above and yellowish white beneath. It is about 11 ins. long, and weighs only about 6 oz. Ranging from Yorkshire to the Shetlands, and found in the wilder parts of Ireland, the merlin lives among the mountains and moors, and nests on the ground among



Merlin. British falcon

the heather, but occasionally it will take possession of a deserted nest in a tree. It preys upon small birds.

Merlin (Welsh Myrddin). Legendary wizard and prophet, celebrated in Welsh, Breton, and Scottish tradition. Of demon origin, he lived, it was said, in the 5th and 6th centuries at the courts of Vortigern and Arthur. Geoffrey of Monmouth wrote his life, and related his deeds in his *Historia Regum Britanniae*. The prophecies of Merlin, dealing with the fortunes of Britain, were popular from the time of Geoffrey to the 17th century, and his adventures were described in romances by English writers, including Malory.

Mermaid. Fabulous creature of the sea or of lakes, with the head, arms, and upper part of the body like a woman, and the lower like a fish. With certain variations the mermaid is found in legendary lore of many nations. Among sailors she is often imagined as sitting on a rock, combing her hair and singing, her appearance being supposed to portend a storm. The corresponding male is called the merman.

The mermaid's wineglass is the name given to an exquisite green seaweed, found in tropical seas. Two other tropical seaweeds are called the mermaid's fan and the merman's shaving brush.

Mermaid Tavern. Tavern formerly in Cheapside, with side entrances in Friday Street and Bread Street, destroyed in the Great Fire, 1666. In this tavern, which dated from before 1529, Sir Walter Raleigh, according to Gifford in his edition of Ben Jonson's works, instituted The Mermaid Club, famous as the supposed meeting-place, about 1603 and onwards, of Shake-

speare, Jonson, Beaumont, Fletcher, Carew, and other wits. But there is no contemporary evidence of its existence.

Mermaid Theatre. London playhouse modelled on a theatre of the time of Elizabeth I. It began in 1951 in a hall in a private garden in St. John's Wood; stage and several of the productions were in 1953 transferred by the promoter, the actor Bernard Miles (b. 1907), to the quadrangle of the Royal Exchange in the City of London as part of the Coronation celebrations of Elizabeth II. In 1957 work began on the construction of a theatre at Puddle Dock, near Blackfriars, on a site let to the interested trustees for ten years by the City Corporation at a peppercorn rent for one year, £50 for the second, £75, £100, and £125 for the following years, and £150 from the sixth to the tenth years.

Merodach-Baladan. Name of two kings of Babylon. The second was a Chaldean chief who, while Sargon II was preoccupied with Samaria, captured Babylon, and reigned 721-719 B.C. Being overthrown he retired to the Sealand; reappearing in 703, at the head of a fresh coalition, he was defeated by Sennacherib after a long and difficult campaign; he ended his days in exile in Elam. See illustration in p. 828.

Meroë. Ancient Nubian city at Bagarawiya, near the right Nile bank 28 m. N.E. of Shendi, below Khartum. It gives its name to the so-called island bounded by the Blue Nile and the Atbara. Occupied before history by Neolithic tribes of the same culture as their northern neighbours, this region lagged behind the advances in civilization made by the metal-working dynastic Egyptians. Hence the Ethiopian stock and culture were strongly affected by Negro contact. Excavating 1909-14 for the Liverpool institute of archaeology, Garstang showed that the city was founded on an earlier site after 600 B.C. by Aspelta from Napata. Meroë soon became the Ethiopian capital, and the centre of a flourishing iron industry. During this "early" period a sun-temple and a temple of Amon were erected, and Egyptian culture was dominant.

After long decadence a "middle" period was inaugurated by Ergamenes (Arqamam) about 225 B.C. This was characterised by Hellenistic influence such as royal baths, frescoed chambers, cremation, and by a non-Egyptian native art, notably a decorated biscuit-ware

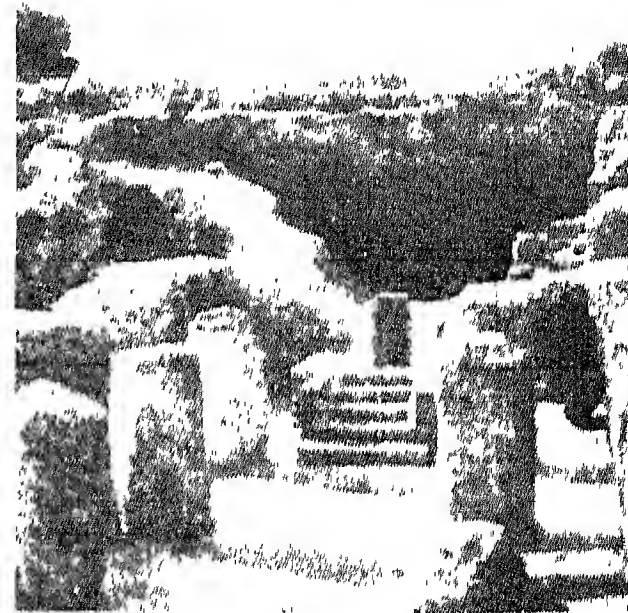
of exquisite fineness. About 150 B.C. the Ethiopian queens began to be called Candace, and it was during this age that about 200 small steep-angled pyramids were built over burned or unummified remains.

A brief Roman occupation was represented by a bronze head, thought to be of Augustus, which was placed in the British Museum. Hereupon followed, A.D. 15, a "late" period of artistic decline, lasting until 700, when Ethiopia was dominated by the Christian kingdom of Dongola, which endured for four centuries after Coptic Egypt adopted Islam. Consult Meroë, John Garstang, 1949; A History of the Sudan to 1821, A. J. Arkell, 1955.

Merom, WATERS OF. Ancient name for Lake Huleh, an expansion of the Jordan farther N. than the Sea of Galilee. It measures rather more than 4 m. by 3 m. A battle between Joshua and the Canaanites took place near by.

Merostoma (Gr. *meros*, part; *stoma*, mouth). Class of arthropoda between Trilobita and Arachnida. The king crab is the only surviving example. A fossil form found in rocks of the Cambrian and Permian age was shaped rather like a scorpion, and the number of remains proves that in the Silurian they were exceedingly numerous. See King Crab.

Merovingians. Name given to the family that ruled over France c. 500 c. 750. It is derived from a Frank named Merovech, a king of the Salian Franks. His descendant Clovis was the real founder of the Frankish kingdom, and a succession of Merovingians ruled over Austrasia, Neustria, and the other small Frankish kingdoms. As the last Merovingian kings were feeble rulers, their authority passed to the mayors of the palace. In 751 Pepin, with the consent of pope and people,



Meroë, Nubia. Hall of Columns in the ruined temple of Amon

deposed Childeric III and shut him up in a monastery. He was the last of the Merovingian kings, who were replaced by the Carolingians. See France; History; Franks.

Merriam, JOHN CAMPBELL (1869-1945). American palaeontologist. Born at Hopkinton, Iowa, Oct. 20, 1869, he was educated at the university of California and at Munich. He taught palaeontology at his own university, 1894-1920, and thereafter was president of the Carnegie institution at Washington until 38. He died Oct. 30, 1945. His published works include *Cave Exploration*, 1906; *Earth Sciences as the Background of History*, 1920; *The Living Past*, 1930; *Application of Science in Human Affairs*, 1938.

Merrick. Mountain in Kireud-brightshire, Scotland, 20 m. N. of Wigtown. Alt. 2,764 ft.

Merrick, LEONARD (1864-1939). British novelist. His family name was Miller, which he changed by deed poll. Born at Hampstead, Feb. 21, 1864, he was educated at Brighton College. In writing, his delicate irony and airy dialogue en-



Leonard Merrick,
British novelist
Russell

deared him to fellow writers, and he was hailed by Barrie as "the novelist's novelist." Many of his stories had Parisian settings and were concerned with literary and theatrical characters. Best known are *The Actor-Manager*, 1898; *Conrad in Quest of his Youth*, 1903; *The House of Lynch*, 1907; *A Chair on the Boulevard*, 1908; *The Position of Peggy Harper*, 1911; *While Paris Laughed*, 1918. A collected edition of his works was issued in 1918, each novel having an introductory appreciation by a distinguished writer. Merrick wrote for the stage, *My Innocent Boy* (with G. R. Sims), 1898; *The Elixir of Youth*; *When the Lamps are Lighted*. He died Aug. 7, 1939.

Merrie England. Light opera by Basil Hood with music by Edward German. Notable for its sprightly and melodious music, it introduces Queen Elizabeth, Essex, Raleigh, and Burleigh among Tudor characters. Its most popular ballads include *O Peaceful England* and *The Yeomen of England*. Produced at the Savoy, London, April 2, 1902, it proved

one of the most successful light operas of its time. It has been several times revived, and is frequently performed by amateur companies. A concert version is sometimes performed.

The title was used for a book by Robert Blatchford which, in the form of letters explaining socialism to an imaginary working man, first appeared as a series of articles in *The Clarion*, a weekly founded and edited by Blatchford. These articles were collected and appeared in book form in 1894.

Merrilies, *Mcg.* Character in Scott's novel *Guy Mannering*, "a kind o' queen amang the gipsies." Her prototype was Jean Gordon, who was ducked to death at Carlisle for being a Jacobite.

Merrill, STUART FITZRANDOLPH (1863-1915) American poet. Born at Hempstead, Long Island, Aug. 1, 1863, he was taken in 1866 to Paris when his father was appointed to the U.S. legation there. He received his early education in Paris, then took a four years' course at Columbia law school. While he was still there his first book of poems, *Les Gammes*, was published in Paris, 1887. His father died in 1888 and the family went to Vienna; from there he sent to the U.S.A. the only book he published in English, *Pastels in Prose* (trans. from French authors), 1890. Merrill settled in Paris in 1892 where he published *Une Voix dans la Foule*, 1909, generally considered his best work, and several other books of poems. An idealist of gentle disposition, he felt acutely the outbreak of war in 1914. He died in Paris, Dec. 1, 1915. *Consult* Life, M. L. Henry 1927.

Merrimac. American ironclad. Launched by the U.S. navy as a frigate, she was sunk by the Federal government in Norfolk Yards on the outbreak of the Civil War 1861, and refloated by the Confederates, who renamed her the *Virginia*. On March 9, 1862 she encountered the Federal ironclad *Monitor* (*q.v.*) in Hampton Roads, and after a sharp fight (the first between ironclads) lasting five hours the *Virginia* was silenced and driven off. She was sunk when Norfolk fell to Federal troops, May 10, 1862.

Merrimac OR MERRIMACK. River of U.S.A. Rising in the White Mts. in New Hampshire, it flows S. for 60 m. into Massachusetts, then E. for 40 m. to enter the Atlantic Ocean, near Newburyport. With its longest headstream it has a length of 180 m. and is navigable to Haverhill. Its

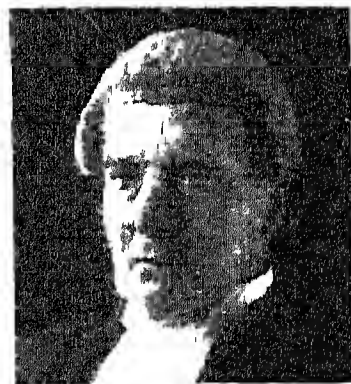
swift fall provides waterpower for many cities, especially Lowell, long a great textile centre.

Merriman, HENRY SETON (1862-1903). Pseudonym of Hugh Stowell Scott, British novelist. Born at Newcastle-on-Tyne, May 9, 1862, and educated at Loretto, he entered an underwriter's office in London. His first novel, *Young Mistley*, appeared in 1888, and the reception of *The Slave of the Lamp* and *From One Generation to Another*, 1892, induced him to leave the city. Thereafter followed in rapid succession *With Edged Tools*, *The Sowers*, *In Kedar's Tents*, *Roden's Corner*, *The Isle of Unrest*, *Barlasch of the Guard*, and several others. Though his characters tend to type, Seton Merriman had the story-telling gift to a high degree. His novels, which are for the most part of the romantic-historical type, early secure the reader's interest and hold it to the last. He died Nov. 19, 1903.

Merrivale, HENRY EDWARD DUKE, 1ST BARON (1855-1939). British judge. Son of a granite merchant, he was born in Devon and as a young man became parliamentary reporter. Called to the bar in 1885, he joined the Western Circuit, and was recorder of Devonport and Plymouth, 1897-1900. He then entered politics, and was Unionist M.P. for Plymouth, 1900-06, and Exeter, 1910-18. Chief secretary for Ireland, 1916-18, he became lord justice of appeal in the latter year, and was president of the Probate, Divorce, and Admiralty div., 1919-33. Raised to the peerage 1925, he died May 20, 1939.

Merry Andrew. Term generally applied to a buffoon at a fair or other public gathering, or to anyone behaving like a buffoon. The name has been traced to a 16th century traveller and doctor, Andrew Boorde, who used to address crowds at fairs and other places in a ludicrous manner, but it is probable that the term a Merry Andrew is of earlier date.

Merry Widow, *THE*. Viennese light opera. Written by Franz Lehar, it was adapted for the English stage by Basil Hood, and produced at Daly's Theatre, London, June 8, 1907, running for 778 performances. Lily Elsie, Joseph Coyne, and George Graves took the



Lord Merrivale,
British judge

leading parts. Its tuneful melodies, especially the waltz and Vilja, made it one of the most popular pieces of its kind, and it was many times revived. Adolf Hitler was reported to have an inordinate liking for the music.

Merry Wives of Windsor, THE. Farical comedy by Shakespeare. Ford, a gentleman of Windsor, is seized with a groundless jealousy of his wife, Mistress Ford, of which she and her friend, Mistress Page, take advantage to bring discomfiture on Sir John Falstaff, who makes love to them both on account of the money he thinks he can obtain from them. The characters include Justice Shallow, Sir Hugh Evans, the Welsh parson, the Host of the Garter Inn, the foolish Slender, and "sweet" Anne Page, and Falstaff's followers, Bardolph, Pistol, and Nym. The Falstaff of this play is less attractive in his roguery than is the Falstaff of the historical plays: less of a wit, more of a fool. The scenes are laid at Windsor.

According to a tradition made current by Rowe in 1709, this play was written about 1598, because Queen Elizabeth, after seeing King Henry the Fourth (*q.v.*), wished to see Falstaff in love. The earliest extant edition is the quarto of 1602. As given in the 1623 folio, the play is almost twice as long as in the quarto. Critical opinion favours the theory of a lost original. The play as usually printed has only 315 lines of verse.

Sources of the plot include the story of Lucius and Camillus in *Il Pecorone* of Ser Giovanni Fiorentino (i, 2), and two tales in *Le tredecì Piacevoli Notti* of Straparola, of one of which an English version appeared in Tarleton's *Newes out of Purgatorie*; and *The Fishwife's Tale of Brainford*, in *Kinde Kit of Kingston's Westward for Smelts*. The bombast of Marlowe and Peele and Jonson's "humours" are believed to be satirised; and discussion has arisen over the supposed allusion to Sir Thomas Lucy in i, 1. The presentation of the buoyant domestic life of an Elizabethan country town bears distinctive marks of Shakespeare's own experience.

Mersalyl. Drug made by the action of mercurial acetate and methyl alcohol on salicylallylamide O-acetic acid and subsequent conversion to the sodium salt. It is used as a diuretic to get rid of excess fluid where a patient is suffering from kidney trouble or heart failure, or from obesity due to poor elimination of fluid.

Mersa Matruh. Coast town of Egypt. It is 180 m. W. of Alexandria and was a strongpoint in the defence of Egypt during the North African campaigns of the Second Great War. Gen. Wavell concentrated large forces at this strategic centre against Graziani's army in the summer of 1940. When the Italians invaded Egypt on September 13, 1940, it was from Mersa Matruh that the Imperial forces launched their attack against Sidi Barrani on December 11. There were raids by Axis aircraft in June, 1942; Mersa Matruh was evacuated by the British forces on June 29, and the town was occupied by Rommel's troops. Armoured units of the 8th Army recaptured Mersa Matruh with little opposition, Nov. 8, during the advance that drove the Germans and Italians out of Libya.

Mersea. Island of Essex. It lies between the estuaries of the Colne and Blackwater, 8 m. S.E. of Colchester. It is nearly 5 m. long and 2 m. wide, and is connected with the mainland by a causeway. It was the scene of Baring Gould's *Mehalah*. West Mersea is a popular pleasure resort.

Merseburg. Town of E. Germany, in the *Land* of Saxony-Anhalt. It is on the Saale, 16 m. W. of Leipzig. The cathedral dates from the 11th to the 16th century. The fine castle was originally built in 1480, and reconstructed in the 17th century. The bishopric was abolished in 1561, and its lands were assigned in 1648 to the elector of Saxony. There was in existence a small duchy of Saxe-Merseburg, 1656-1738, the duchy then reverting to Saxony, but in 1815 most of it was given to Prussia. During the First Great War many prisoners of war were interned here; during the Second Great War it was captured by units of the U.S. 1st army, April 15, 1945, suffering considerable damage especially in the harbour region. After Germany's surrender it lay within the Russian zone of occupation.

Mersey. English river. Formed by the union of the Goyt and the Etherow, in Derbyshire, and flowing generally W. between Lancashire and Cheshire, it enters the Irish Sea by an estuary 16 m. in length. From the right it receives the Tame, at Stockport, and the Irwell, and on the left its chief



Mersey. Map of the estuary or Liverpool channel which separates the counties of Cheshire and Lancashire

tributaries are the Bollin and the Weaver. Warrington lies on the right bank, and important towns along the estuary are Runcorn, Widnes, Liverpool, Birkenhead, and Wallasey. At Eastham, on the estuary, is the entrance to the Manchester Ship Canal, and beneath the bed of the river, extending from Birkenhead to Liverpool, is the Mersey Railway Tunnel, opened in 1886, and a road tunnel (*see* Mersey Tunnel), opened in 1934. Plans to replace the transporter bridge between Widnes and Runcorn by a single span road bridge were announced in 1957. The estuary, which varies in breadth from 1 m. to 3 m., is partly obstructed by sandbanks. Dredgers are used to keep open the channel for the largest liners. The Mersey, with its estuary, is 70 m. long.

Mersey, JOHN CHARLES BIGHAM, 1ST VISCOUNT (1840-1929). British lawyer. Born Aug. 3, 1840, the son of a Liverpool merchant, he was educated at Liverpool and abroad. Called to the bar in 1870, he became a Q.C. in 1883, and in 1897 was made a judge of the high court. He became president of the probate, divorce, and admiralty division in 1909, and retired in 1910 with a barony. In 1916 he was made a viscount. Lord Mersey was the commissioner appointed to inquire into the Titanic disaster in 1912, and into the loss of the Lusitania and Falaba in 1915. He died Sept. 3, 1929, and was succeeded by his son, Charles Clive



1st Viscount Mersey,
British lawyer

Bigham (1872-1956). The 2nd viscount was educated at Eton and Sandhurst, and commissioned in the Grenadier Guards. He was on the British Embassy staff at St. Petersburg, Constantinople, and Peking, and during the Boxer rebellion was A.D.C. and intelligence officer to Admiral Seymour. He was chief Liberal whip in the house of lords 1944-49.

Mersey Docks and Harbour Board. Public trust constituted by the parliament of the U.K. in 1857 to control the sea approaches and docks at Liverpool and Birkenhead. It has 28 members, 24 elected by dock users and four appointed by the minister of Transport. The board maintains the largest enclosed dock system in the United Kingdom, as well as lighthouses, lightships, and other

aids to navigation. The annual revenue from ships and goods is about £7,500,000. The offices are on the pier head.

Merseyside. Dock areas of Liverpool and Birkenhead on both banks of the Mersey, controlled by the Mersey Docks and Harbour Board (*v.s.*). The docks at Liverpool have nearly 40 m. of quays, those at Birkenhead about 10. Many attacks were made on Merseyside by German aircraft during the Second Great War, heavy damage being inflicted on five consecutive nights early in May, 1941.

Mersey Tunnel. Tunnel for vehicular traffic under the Mersey river, England. Begun in 1925 and opened in 1934, it affords rapid communication between Liverpool and Birkenhead and links Lancashire with the Wirral peninsula. The main portion takes four lines of traffic abreast, and the total length is 2½ miles. Important features are the ventilation and lighting arrangements and a system of fire stations, placed at intervals of about 50 yds., with automatic fire alarms to stop the traffic. Its normal capacity is 4,150 vehicles per hour. At its deepest point it is 170 ft. below high-water level. The cost of the project was over £7,000,000.

Mersin. Port of Asiatic Turkey. It is on the Mediterranean, and is connected by rly. with Tarsus and Adana. It exports timber, wool, cotton, and fruit. Works expected to give Mersin the largest harbour in Turkey by 1959 were under construction in 1957. Pop. (1955) 51,251.

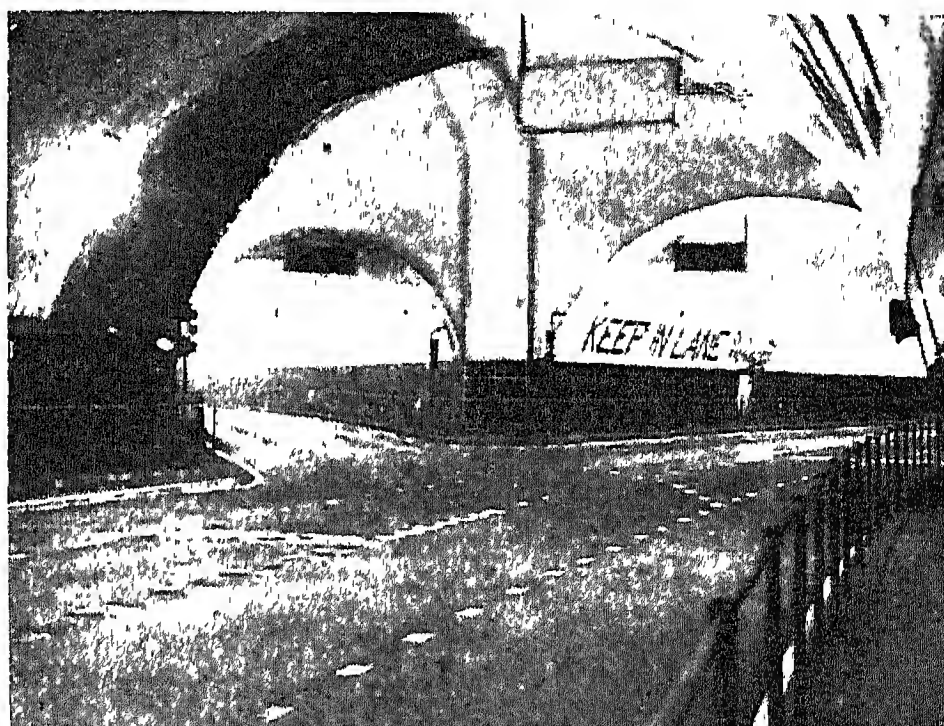
Merthyr Tydfil. Co. borough and former market town of Glamorganshire, Wales. It stands on the Taff, 24 m. N.N.W. of Cardiff, and is well served by British rlys. There is a service of municipal buses. The old parish church has been rebuilt, and there are many other ecclesiastical buildings, all modern; recent also are the town hall, drill hall, free



Merthyr Tydfil

library, and general hospital. The grounds of Cyfarthfa Castle are public property, and the castle itself has been converted into a secondary school. Merthyr stands on the S. Wales coalfield, and has up-to-date factories besides its mines. The borough includes Dowlais, Cyfarthfa, Pen-y-darren, and Plymouth. Pop. (1951) 61,142.

The village of Merthyr owed its name to a female saint, S. Tydfil, martyred in the 5th century. In 1759 ironworks were opened at Dowlais, and soon afterwards at Cyfarthfa, Plymouth, and elsewhere. As separate industrial villages these places expanded during the 19th century, and in 1905



Mersey Tunnel. A junction near the Liverpool end. The road to the left leads to the docks; the right to Kingsway, Liverpool, entrance. The tunnel was opened by King George V, 1934

they were united together in a borough which in 1908 was made a co. bor. Merthyr has returned a member to the house of commons since 1832; in 1948 it was made a borough constituency.

Merton, WALTER DE (d. 1277). English prelate. His family was connected with Basingstoke. He was ordained 1235. Sent by Edward I on a mission to Rome, he was in 1261 made chancellor, and in 1274 bishop of Rochester. His chief fame is due to his foundation of Merton College (*q.v.*).

Merton and Morden. Urban dist. of Surrey, England. Formed 1911 by the union of the urb. dist. of Merton, 1907, and the parish of Morden, it is well served by London Transport, Morden being the southern terminus of the Northern line (underground rly.), and by British rlys., Southern region. The district, mainly residential, has a long history. Cynwulf, king of Wessex, was murdered here in 784. An Augustinian priory was founded in 1117, near the river Wandle; it was dissolved in 1538. The great council

of the nation was held at Merton Priory in 1236, when the famous statutes of Merton were passed in reply to the attempt of the king and prelates to force upon the people the rule of canon law for the legitimation of children born before the wedlock of their parents. Crown property during 1538-1610, the priory site in 1724 became the centre of a calico-printing factory. Material from the priory buildings was used in the construction of Nonsuch Palace at Ewell. Merton Place, now no more, was the residence of Nelson and Sir William and Lady Hamilton. Merton parish church of S. Mary, frequently restored, dates from the Norman period, and contains notable monuments. Morden parish church of S. Lawrence was rebuilt in the Gothic style in 1636. St. Helier, an L.C.C. housing estate of 850 acres, was started here 1927. Industries include engineering, and toy and banknote making. Pop. (1951) 74,730.

Merton College. One of the colleges of the University of Oxford. It was founded in 1264 by Walter de Merton (*q.v.*) at Malden, Surrey, not being removed to Oxford until 1274. The buildings in Merton Street are among the oldest in Oxford. The large chapel, once a parish church, contains some beautiful work. The library, 14th century, is notable; and the small treasury is one of the oldest parts of the college. Merton includes S. Alban Hall, incorporated with it in 1882, of which only the façade, c. 1600, remains. There is a small but beautiful garden, enclosed by the city wall, and some new buildings. The college owns property at Merton, Surrey. Its head is the warden, and its scholars are called postmasters. Steele, Bishop Creighton, and Sir Max Beerbohm were among past students.

Meru. Mountain of Tanganyika. It lies W. of Kilima-Njaro, and reaches an alt. of 14,980 ft. On the slopes is Aruscha, occupied by the British, March 20, 1916.

Merv. Ancient town of central Asia. It lay in an extensive fertile oasis between the Oxus (Amu-Daria) and N.E. Persia, 18 m. E. of the 19th-century town of Turkmen S.S.R. called Mary. Merv was a centre of Islamic culture in the Middle Ages, when it was of strategic importance also, as it

lay on the road to Persia and Herat. After being successively in Persian, Macedonian, Arab, Seljuk, Mongol, Uzbek, and Turkoman hands, it was captured by Russia in 1884.

On the site of Merv a new town has sprung up called Bayram-Ali, through which passes the Trans-Caspian rly. It is a cotton manufacturing centre, within Mary region of Turkmen S.S.R., and has also vegetable oil mills and a soap factory.

Méryon, CHARLES (1821-68). French etcher. Born in Paris, Nov. 24, 1821, he was the son of an Eng-



Charles Méryon,
French etcher
After Bracquemond

lish physician and a French dancer. From the naval school at Brest he went to sea. It was not until 1846 that he adopted the artistic profession and settled in Paris. Colour-blindness preventing him from being a painter, he devoted himself to engraving and etching. He became a pupil of Bléry, and began work on the series of etchings of Paris scenes which afterwards made him famous. Symptoms of mental disease showed themselves in 1858-59 and Méryon was removed to the asylum at Char-enton. From 1866 he was again confined there, dying Feb. 13, 1868. Méryon

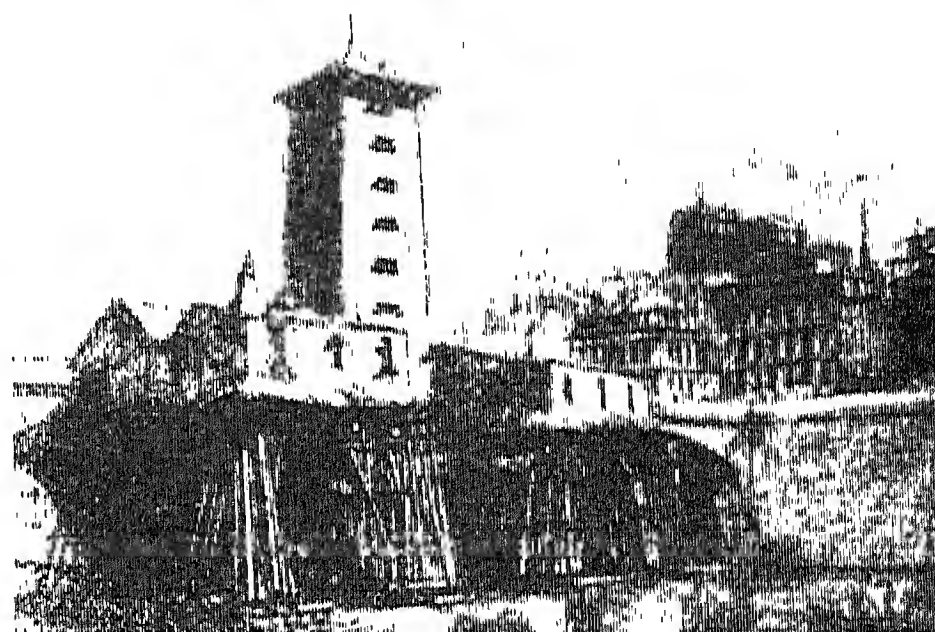
produced many plates of great beauty and delicacy, some of them

including odd fantasies in the middle of a straightforward rendering of an actual scene.

Mesa (Span. from Lat. *mensa*, table). In geography, large, tabular, steep-sided blocks of land produced by the dissection of a plateau by the agency of rivers. The term is in common use for the great plateaux of the western states of the U.S.A. When extensive dissection takes place, parts of the mesa become detached and are called buttes.

Mesa or LA MESA. Town of Colombia, S. America, in the dept. of Cundinamarca. Beautifully placed in the midst of plantations, at an altitude of 4,000 ft., it is 30 m. W. by S. of Bogotá. The surrounding area produces sugar, coffee, cocoa, and cereals, and there is trade in salt and hats. Near by is the peak of El Picacho, from which there is a fine view of the district. Pop. (est.) 12,200.

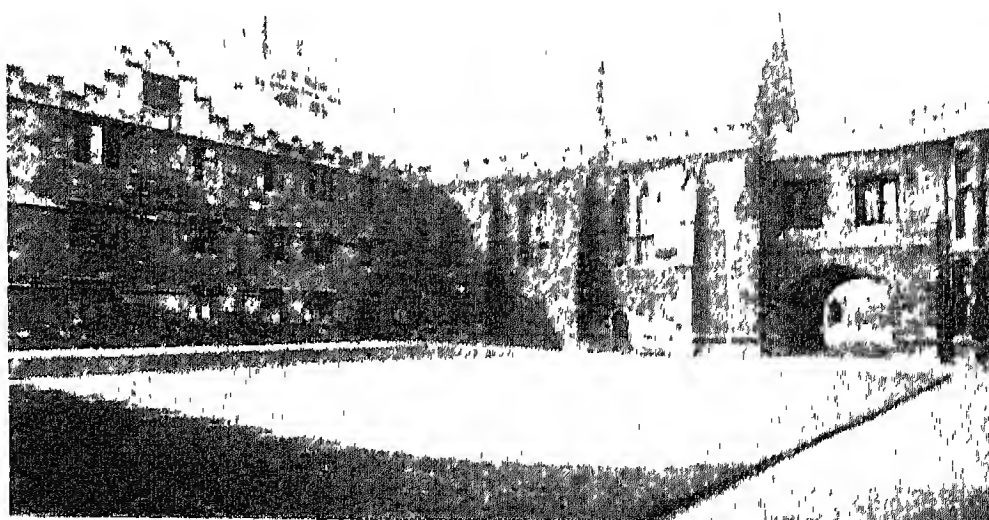
Mesa de Herves. Mountain of Colombia, in the Andes, near Bogotá. It is a table-topped mass, and its slopes are snow-covered all the year round. It reaches a height of 18,350 ft. above sea level.



Charles Méryon. Pont Notre Dame, 1852. One of this artist's etchings of Paris views

Mesaticephalic or MESOCEPHALIC (Greek, medium-headed).

Adjective applied conventionally to skulls of which the cranial index (the percentage ratio of breadth to length) falls between 75.0 and 79.9, and in the living to heads of which the cephalic index falls between 77.0 and 81.9.



Merton College, Oxford. Quadrangle, showing the hall and the tower of the chapel

Mescal. Name of a kind of brandy distilled from pulque, which is the fermented sap of the American aloe. See Agave.

Mescal Button (*Anhalonium lewinii*). Succulent plant of the family Cactaceae, native of Mexico and Texas. It is interesting chiefly on account of its power to produce visions after the manner of hashish (*q.v.*), though of a different character. The chewing of mescal is an old practice of the Kiowa Indians in their religious ceremonies, and the rite has spread to the other tribes of the southern plains of the U.S.A. Weir Mitchell, Havelock Ellis, and others have recorded their experiences when under its influence.

Mesdag, HENDRIK WILLEM (1831–1915). Dutch painter. Born at Groningen, Feb. 23, 1831, he was at first engaged in commerce, but on the advice of Josef Israels took up painting and studied under Alma-Tadema in Brussels. Afterwards he devoted himself to marine painting. He lived at The Hague, but most of his time was spent at Scheveningen and other seaside resorts, where the sea and its ships occupied his brush. His art is sober in colour, but intensely naturalistic. Died July 10, 1915.

Mesembryanthemum (Gr. *mesēmbria*, noon; *anthos*, flower). Large genus of plants of the family Ficoideae. Mostly natives of S. Africa, they have succulent leaves and bear pink or white flowers suitable for culture in the rock garden. They thrive best in a light soil and sunny aspect, and are a striking feature of the Scilly Isles. *M. crystallinum* is the well-known ice plant. See Ice-Plant.

Mesentery. Fold of peritoneum which attaches the intestine to the posterior abdominal wall.

Mesh. Term used generally to describe all screens used as sieves. It has a particular application in powder metallurgy, being defined as the screen number of the finest screen of a specified standard scale, through which all of a powder sample will pass. All metal powders must be carefully sized before mixing before the pressing and sintering processes. See Powder Metallurgy.

Mesha. King of Moab about 850 B.C. On the death of Ahab of Israel, he withheld his annual wool tribute (2 Kings 3). He was besieged by Jehoram of Israel in Kir (Kerak), and sacrificed his son to Chemosh. A contemporary inscription records these campaigns from the Moabite standpoint. See Moabite Stone.

Meshcheryak. People of Finnish stock in E. Russia. Now numbering about 180,000, they migrated in the 15th century from the Oka basin. The E. branch, near Ufa and Perm, rank in name, customs, and religion as Bashkirs, although broad-faced and blond-haired. The W. branch, near Saratov, is more Russified.

Meshed, MESHIED, OR MASH-HAD. Town of Persia, capital of prov. 9 (Khorassan), Persia, 600 m. E. of Teheran. It is regarded as a holy city by the Shiah Mahomedans, because it contains the tomb of the Imam Riza, the son of Ali, and therefore the grandson of the Prophet. The dome minaret, and interior of the portico of his shrine are covered with gold plate on copper, and with coloured arabesques and inscriptions from the Koran written upon superb medieval tiling. The shrine is forbidden to unbelievers. Near by is a beautiful blue-domed mosque of the 15th cent. Meshed trades in carpets, silks and shawls, and a sword-making industry. It has a court of appeal. It derives much of its prosperity from pilgrimages to the Imam's mausoleum, visited each year by upwards of 200,000 Shiites. Population 176,000.

During the First Great War Meshed was occupied by the British in 1918 to protect the Transcaspian rly., a short distance N. of the town, from Bolshevik attacks. An East Persian cordon field force was constituted, and a motor road built from Duzdap, Baluchistan, to Meshed and thence to Askhabad. The whole enterprise cost nearly £100,000,000. Meshed was abandoned in 1920. In the Second Great War it was a vital staging point on the route by which motor transport carried supplies from India to Russia. The town was occupied by Soviet troops, 1941–46, and was the scene of severe fighting during the Persian revolt after the war.

Mesitylene OR SYMMETRICAL TRI-METHYL-BENZENE. Light oil hydrocarbon obtained from coal-tar. It is also prepared by distilling acetone with sulphuric acid, or by dissolving methyl acetylene in sulphuric acid and distilling with water.

Mesmer, FRIEDRICH ANTON (OR FRANZ) (1734–1815). German physician, inventor of mesmerism. Born at Iznang, Baden, May 23, 1734, he graduated M.D. in Vienna. Dabbling in astrology and electricity, he invented "animal magnetism" and apparently discovered hypnotism, though it was not yet

so called. In 1766 he published his first work (in Latin) on the Influence of the Planets on the Human Body. Meeting

Gassner, who effected cures by manipulation, Mesmer discarded magnets, and in Paris from 1778 he undoubtedly cured many people by self-suggestion; but he used much



F. A. Mesmer, German physician

mummery and was denounced as an impostor by the faculty. Nevertheless he had a great success, and scientific investigation of the phenomena connected with his practices led to the rediscovery of hypnotism. He died at Meersburg, March 5, 1815.

Mesmerism. Name given to a method of producing a trance or sleep, first practised by the above Franz Mesmer. Early attempts at mesmerism were a combination of trickery and charlatanism, and the later scientific study of the process has become better known under the name of hypnotism. Mesmer, who undoubtedly discovered some of the rudiments of hypnotic processes, believed that an occult force pervaded the universe and was one which, properly controlled, had a great effect on the nervous system of human beings. His consulting-rooms were always dimly lighted, hung with mirrors, and filled with the scent of burning chemicals. Mesmer himself dressing as a magician. The way Mesmer produced his effects was copied by swindlers and tricksters of all kinds, with the result that mesmerism fell into disrepute until the subject began to be scientifically studied towards the end of the 19th century. See Hypnotism; Magic.

Mesne Process. In old English law, those writs which were issued in an action between the first and the last process, *i.e.* between the first writ and the writ of execution. The Debtor's Act, 1869, finally abolished arrest on mesne process, except that a person who owes £50 or more can be arrested, if it be shown that he is about to escape out of the jurisdiction to avoid his liability. *Pron. mean.*

Mesne Profits (Lat. *medius*, intermediate). Rents and profits of an estate accruing to an occupier remaining in unlawful possession, *e.g.* after the expiry of a lease. An action of mesne profits is an action of trespass brought by the true

owner, to recover the rent and profits which the trespasser has, or might have, made during his improper occupation. It may be joined with an action for recovery of the estate, or brought after an order of ejectment. A claim for mesne profits is unliquidated, and damages may be given, from which ground rent paid by the tenant should be deducted.

Mesocephalic. See Mesati-cephalic.

Mesoderm OR MESOBLAST. In embryology, the middle germinal layer of an embryo. In all organisms which possess two or more definite tissues arising from the fertilised egg, the embryo forms three separate layers, an outer, inner, and middle, the mesoderm. The cavity which results from the dividing of the mesoderm becomes the body cavity.

Mesolithic (Greek *mesos*, middle; *lithos*, stone). Term used for the period in human culture between the end of the Palaeolithic period, which closes with the Pleistocene of the geologists, and the rise of the Neolithic culture, when man began to grow his food. It is the age in which man adapted himself to the change from glacial to temperate and forest conditions. Distinctive cultures of the Mesolithic are the Azilian, Tardenoisian and Maglemosian.

Meson. Term applied to a number of sub-atomic particles intermediate in mass between the electron (*m*) and the proton (1,837 *m*). Their existence was predicted by the Japanese physicist H. Yukawa in 1935, in order to account for the very strong binding forces in atomic nuclei. Mesons of mass 200 *m* (μ -mesons) and 320-*m* (π -mesons) have since been found in cosmic rays, and have been produced by means of synchrotrons. They may carry either a positive or negative charge and are short-lived (half-lives are estimated at a few micro-seconds). Neutral mesons, and mesons with masses in the neighbourhood of 1000 *m*, have also been reported.

Mesophyll (Gr. *mesos*, middle; *phyllon*, leaf). Spongy ground tissue of leaf structure lying between the upper and the lower layers of epidermal cells. It consists of soft-walled cells filled with protoplasm, in which are numerous chlorophyll granules and a more solid nucleus. The upper layers of mesophyll consist of elongated palisade cells packed closely together side by side. The lower layers, or spongy parenchyma, are loosely disposed, with

considerable air spaces between them, communicating with the stomata or breathing pores.

Mesopotamia (Gr., between the rivers). The classical name for the district between and on either side of the rivers Tigris and Euphrates north of the latitude where they approach each other most nearly, i.e. in the region of Bagdad. The area included the northern part of what has been called the "fertile crescent," Assyria and Palmyrene and that part of North Syria which is today called Jezireh. In the O.T. (Gen. 24) it appears as Aram Naharaim, the riverine land of the Aramaeans (see Aram). The term Mesopotamia was later extended to include the whole valley of the Two Rivers (the modern Iraq).

It was in ancient Mesopotamia that some of the earliest traces of civilized man have been found, and the country witnessed many of the great inventions that have stimulated human progress. Palaeolithic man lived in the caves of Kurdistan, and Neolithic village settlements have been found in several sites around Kirkuk and Mosul, in which the first crude pottery was fashioned and perhaps the first tentative experiments made in agriculture. Techniques of housebuilding, painting as a decoration on pots, mat-weaving, and stone-working seem to have been quickly mastered, but it seems to have been in the south, on the alluvial plain watered by the annual flooding of the rivers, that the step was taken of welding small communities into a larger unit with a central administration controlling irrigation and regulating economic life, and so creating the city-state. The development of civilization from this point took on so uniform an aspect over the whole of Mesopotamia that the term is here used in its wider sense to include the ancient Sumer to the Persian Gulf.

The Early City States

The geography of ancient Mesopotamia was in many ways similar to that of modern Iraq (see Assyria map, p. 688; Iraq map, p. 4560), but some changes have taken place over the millennia. The waters of the Persian Gulf may have reached as far north as Eridu, the most southerly Sumerian city, since the alluvial delta through which flows the Shatt-el-Arab is of comparatively recent formation. The rivers, swollen by flood, have sometimes changed their course, and the sites of many ancient

cities once on the Euphrates are many miles out on the barren plain. Central Mesopotamia and much of the south was once very much more fertile, being watered by a network of canals forming a most elaborate and carefully maintained irrigation system; these ancient canal beds are now dry banks of mud running through a waterless desert. In northern Mesopotamia this desiccation has been attributed by some to decreasing rainfall, but may again be the result of neglect or deliberate destruction of the canal system.

The fauna of ancient Mesopotamia was similar to that of the present day with one or two additions: the onager, now no longer found, was caught and tamed as a draught animal; the lion and wild ox, which abounded in the north, were hunted in game preserves by Assyrian kings, and elephant were still to be found on or near the upper Euphrates until the 9th century B.C.; they too were sport for kings, and Egyptian pharaohs campaigning in Syria record their successes in elephant-hunting. Camels were ridden by the desert tribes (see Aramaeans), but were not introduced into Assyria until the 8th or even 7th century B.C. Sheep, dogs, oxen, and goats were domesticated, and barley and wheat, dates, onions and other vegetables, dried fish, sesame oil, and beer were staples of diet. In the marshy conditions of Lower Mesopotamia a mud-and-reed architecture evolved much like that of the marsh Arabs today; high-prowed boats very like those built today by the Ma'dan of the marshes were used to carry the Sumerians and their cargoes by river and canal, and reeds were also used to manufacture the round bitumen-caulked boats called today by their ancient name of goofah or guffa (see Iraq, p. 4559, fig. 5).

The Sumerian city centred around the temple, which was the centre of economic as well as religious life. In theory the whole city in fact was the property of the god; he owned the land and leased it out in lots to the people who were his tenants; he therefore expected a share of the harvest. Priests also had their allotments, and craftsmen paid for their materials with a tithe of the products of their labour. Some land was worked in common by the whole community, and the whole community was responsible for the upkeep of dykes and canals.

As cities increased in size, the organization of the temple and its

dependencies grew increasingly complex, and the temple itself larger; all business was transacted within its walls and, as writing on clay tablets developed, contracts, loans, receipts, and other commercial documents were deposited in the temple archives. A great temple tower, called the ziggurat, rose in the midst, and other temples, sacred to deities other than the city god, began to rise, each with its own community of "the god's people." Streets were narrow and the houses rose to two storeys or more; the larger ones were built with a courtyard and had steps leading to the roof on which, as today in Iraq, the family would sleep in hot weather. The laws set severe penalties for a "jerry-builder" whose house collapsed and killed someone.

Early codes of law have survived, some of them a century or more older than the well-known Code of Hammurabi. They reflect a society with well-developed laws of property, a comparatively emancipated status for women, and a criminal code which discriminated between intentional and accidental injury, and graded punishment to fit the social standing of both the culprit and the victim. Foreign slaves, obtained by war or trade, were employed chiefly on the great royal and temple estates, though Babylonian citizens, their wives or children, could be temporarily enslaved to creditors in payment for debt. The Assyrian legal code is harsher than the Babylonian, and reflects the different temperament of the warlike people who devised it. Masters have more power over servants, husbands over wives, and fathers over children.

History of Mesopotamia

Essentially a mixture of Sumerian and Semitic elements, the population of Mesopotamia was constantly being invigorated by new blood; Indo-European elements among the Kassites and Hurrians made contributions to civilization and, in particular, brought in the horse and the light war-chariot, and new weapons and fighting tactics, during the second millennium B.C. The civilization of Babylonia continued to develop along the same lines that were laid down in the early centuries of the Sumerian city state; the religion and mythology of the Assyrian and Neo-Babylonian periods owe much to Sumerian thought, the cuneiform tablet continued to be the writing medium,

and the Akkadian language became the *lingua franca* of the known world until it was displaced in the first millennium by Aramaic. (For history of Mesopotamia before classical times, see *Babylonia and Assyria*.) The death of Alexander at Babylon in 323 B.C. was followed by wars for the succession, and in 312 B.C. Seleucus, one of his generals, secured the central part of his empire, including Mesopotamia. The Parthian Arsacid dynasty, after a successful rebellion against the Seleucids in 249, ultimately took Babylon and set up their residence at Ctesiphon. Rome about 66 B.C. became involved in wars with Parthia, and Trajan in A.D. 115 advanced into Mesopotamia, but his gains were soon lost. In A.D. 226 the Sassanid dynasty of Persians took control of the country, and in the long series of wars with Rome it was a frequent battleground.

About the 6th century the Turks began to appear in Persia. The Arabs founded Basra and Kufah in 636; and in 637 decisively beat the Persians at Cadesia. The Arabs annexed Mesopotamia and ruled the country for 400 years. Under the Abbasid caliphs Bagdad became the centre of a brilliant civilization.

But the Seljuks, originally from Turkistan, overran the land in the 11th century, and another Mongol wave swept in after the death of Jenghiz Khan in 1227. Hulaku in 1258 captured Bagdad and put an end to the Abbasid caliphate. Under Mongol rule the old canal system was destroyed and the country was at a low ebb; Tamerlane invaded and plundered it again in 1393-94. For a century Persia and Turkey disputed the sovereignty, and in 1516 Mesopotamia passed under the Turks and so remained until the defeat of Turkey in the First Great War and the mandating of the area to the British by the League of Nations in 1919. (For later history of Mesopotamia, see *under Iraq*.)

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Mesopotamia Campaign, 1914-18. British campaign of the First Great War. The Mesopotamian Expeditionary Force left India on Oct. 16-18, 1914, to rendezvous at Bahrain. On Nov. 6, within a week of the entry of Turkey into the war, a force landed and occupied Fao fort and town. The main advance began Nov. 17. Basra fell on Nov. 21, Kurna on Dec. 8.

A critical period followed, while the Turks were concentrating on the Euphrates for a thrust to recapture Basra, but they were routed at Shaiba, April 12-14, 1915. With the capture of Amara, on the Tigris, June 3, the main objects of the expedition were achieved. The British held the delta of the Shatt-el-Arab, and were thus in a position to protect the Anglo-Russian oilfields at Ahwaz, and to safeguard the gulf, and close to Germany her main route to India. But political considerations required the force to be moved on towards Bagdad. The advance of Maj.-Gen. Townshend and his 6th div. included the victory at Kut-el-Amara, Sept. 29, and culminated, Nov. 22-25, in the fighting at Ctesiphon, 18 m. from Bagdad, when the force annihilated a Turkish division. But the division was too thinned to hold the position against Turkish reinforcements, and Townshend was obliged to fall back on Kut. Two Indian divisions moved from France were detailed to reinforce Townshend but had not completed embarkation when news of Townshend's investment arrived. One of these divisions was virtually immobilised in actions at Sheikh Saad, the Wady, and Umm-el-Henna, Jan. 7, 13, and 21, 1916. Transport broke down and troops were thrown into the attack as they arrived.

Up to this time the campaign had been directed by the govt. of India. In Feb. the War office took it over. Townshend reckoned that he had sufficient supplies in Kut to hold out until the end of March. But to reach Kut the British had to work round to the Turkish rear. The advance began on March 8. The Turks evacuated Umm-el-Henna on the night of April 4-5, and fell back on Sanna-i-Yat, a few

miles in the rear. The British were faced with the same problems as before, and the difficulties were now increased by floods. Three desperate but ineffectual assaults were made by troops floundering in water, their rifles jammed with mud. Further sacrifice was averted by the fall of Kut, with the surrender of 3,000 British and 6,000 Indians starved after an heroic defence of nearly five months. The relieving force had lost nearly 22,000 men.

Gen. Maude succeeded to the command, Aug. 16, and took the field in Dec. in an attempt to open the road to Bagdad. After two months of continuous fighting against a stubborn defence, the British drove the Turks from their elaborate trench system on the right bank of the river, and a crossing was effected on Feb. 23, 1917. Sanna-i-Yat was forced, the river made free for navigation, and the door to Bagdad made open. The Turkish commander, Khalil Bey, ordered a general retirement. The pursuit was hotly pressed. The Turkish rear-guard stood at the Diala, but a Lancashire brigade forced the passage in a gallant action, and the British entered Bagdad on March 11.

Securing the Position

But the city was not secured until Turkish points on the Tigris, Euphrates, and Diala were carried. Columns pursued the Turkish army corps on both banks of the Tigris, a third column moved to the Euphrates, and a fourth advanced by the Diala over the Jebel Hamrin range to cut off a Turkish corps which was falling back over the Persian border from attacks by Russian forces. The advance of this column cleared Persia of the Turks, but the retiring Turkish corps was able to extricate itself from the British pursuit and attempted to link itself with the left bank column of the Turkish corps on the Tigris. After a series of hard-fought minor actions it was finally routed in the sanguinary battle of Band-i-Adhaim, April 30.

Meanwhile the British column on the right bank of the Tigris had advanced, during decisive victories at Mushediya, March 14, and Istablat (April 21-23). The latter action gave Maude the Turkish railhead at Samarra and thus secured his hold on Bagdad.

British gains were extended during the winter of 1917-18. On the Euphrates they inflicted two crushing defeats on the Turks at Ramadie (Sept. 29) and Khan

Bagdadi (March 27, 1918), the enemy force on each occasion being almost entirely captured. But meanwhile the defection of Russia had opened to Germany an easier line of penetration to the East by way of the Caucasus, and the British were obliged to counter this move by the establishment of posts in Persia and communications to the Caspian sea. Her attempt to save Baku from the Turks by a small force sent to the assistance of the Russian and Armenian garrison (Aug.-Sept., 1918) failed, but the thin line between Bagdad and the Caspian was thereafter held intact.

End of the Campaign

Gen. Maude, who died of cholera in Bagdad, Nov. 18, 1917, was succeeded by Gen. Marshall. During the spring and summer of 1918 the force was mainly engaged in settling and developing the country, but the British military campaign was brought to a brilliant close in the autumn with an advance on Mosul. Kirkuk was re-entered on Oct. 24; Kala Shergat, 50 m. S. of Mosul, was captured Oct. 28; and on the following two days Marshall defeated the Turks a few miles further N. in a decisive battle, destroying or capturing their entire forces. Turkey was granted an armistice on Oct. 30, and Marshall occupied Mosul on Nov. 3, 1918.

There was strong criticism of the details of the campaign. A very small Turkish force, with good interior lines, was able to contain a very considerable British force, and it was argued that the latter should have cut their losses after the fall of Kut, and delivered the counter-stroke nearer the heart of the Turkish system. The Turks depended for munitions on all their fronts on the single rly. line from Constantinople to Aleppo, and if the British had taken Aleppo they could have held the delta of the Shatt-el-Arab with a single division. The British troops N.E. and W. of Bagdad did not materially help Allenby's army in Palestine.

On the other hand, when the British struck at Bagdad they were counting on simultaneous pressure by the Russian army in the North as the upper half of a pincer movement; but the Russian arm was paralysed. The occupation of Bagdad immensely increased British prestige, secured Persian neutrality, weakened the fanatical influences at work in Afghanistan and on the Indian border, and averted a Pan-Islamic conflagra-

tion which might have created a dangerous situation in India. Possibly the chief vindication of the forward policy is that it established British command of communications between Bagdad and the Caspian. *Consult* Official History of the Great War—The Campaign in Mesopotamia, F. J. Moberly, 4 vols., 1923-27; also The Long Road to Bagdad, E. Candler, 1919; War in the Garden of Eden, K. Roosevelt, 1920; My Campaign in Mesopotamia, Maj.-Gen. Sir C. V. F. Townshend, 1920.

Mesothermal Deposits. In mining geology, a class of mineral deposits. They are formed from ascending thermal solutions under intermediate temperatures and pressures, the solutions having a genetic connection with igneous rock formation. Deposits are generally found in sedimentary or metamorphic rock near the parent igneous rock, which may or may not be exposed. The temperature of their formation is taken to range from 175° to 300° C. The pressure is generally related to the depth of deposition, which ranges from 4,000 to 12,000 ft. below the original surface.

Important deposits in this group include those of gold (California and Cordilleran region, U.S.A.; Bendigo, Australia); silver-lead (British Columbia; Colorado); silver-lead-zinc (Idaho, U.S.A.); copper (Butte, Montana; Rio Tinto, Spain); and others. The ore minerals consist of sulphides, arsenides, and sulpharsenides of the metals; the predominant gangue minerals are quartz and the carbonates. They occur both in the vein and in the adjacent wall rock. Replacement of one mineral by another is common in the veins; the vein minerals may show banding and occasionally colloform structures. *See* Comb Structure.

Mesozoic Era. In geology, one of the main divisions of time. It came between the Palaeozoic and the Cainozoic eras, and is divided into three periods, the Triassic, Jurassic, and Cretaceous. Mesozoic rocks are found in Great Britain, Europe, and N. America, and are chiefly limestones. The era was one of giant reptiles, and during this period mammals and birds came into existence, and cycads, conifers, and ferns were the chief flora.

Mesquite. Variant spelling of Mezquit (*q.n.*), American tree.

Mesrob OR MESROP, MASHDOTS (c. 354-441). Inventor of the Armenian alphabet. He was a

prelate of the Armenian Church, active in repressing idolatry and heresy. In 406 he compiled the Armenian alphabet, probably from Greek and other sources, consisting originally of 36 letters, to which two have since been added. He directed the preparation of the first Armenian version of the Scriptures.

Mess. Term originally meaning a dish of prepared food, sent to the table (*cf.* a mess of pottage). It is now applied to the quarters in which groups of people take meals together, particularly in the armed forces—officers' mess, sergeants' mess, etc. In general the word covers ante-rooms, etc., attached to the dining quarters, and is used by extension to describe the body of members who use the mess. Originally a mess in this sense was a group of four people who were helped from the same dish, and in London's Inns of Court this number is retained.

Messenger, André Charles Prosper (1853–1929). French composer. Born at Montluçon,



André Messenger,
French composer
H. Manuel

Dec. 30, 1853, he studied under Saint-Saëns, and became a church organist in Paris, but soon was composing for the stage. His first comic opera, *La Fauvette du Temple*, was produced in 1885. Of many light operas the best-known include *La Basoche*, 1890; *Les P'tites Michus*, 1897; *Véronique*, 1898 (popular in England and the U.S.A.); *Fortunio*, 1907; *L'Amour Masqué*, 1923. He also composed music for an English operetta, *Monsieur Beaucaire*, 1919. His three-act ballet, *Les Deux Pigeons*, 1906, was long in the repertory of the Paris Opera, of which he was artistic director 1907–13. A similar post had been held at Covent Garden, 1901–06. Messenger's music is notable for elegance of texture. He married Hope Temple, composer of ballads. He died Feb. 24, 1929.

Messageries Maritimes de France. French steamship line. Originally founded as the Messageries Impériales in 1851, it served Mediterranean ports, but later extended its activities to India, Indo-China, China, Australia, E. Africa, Madagascar, and S. America. In 1921 the Société des Services Contractuels des Messageries Maritimes was formed to

operate the passenger services, but the Compagnie des Messageries Maritimes remained in charge of the whole fleet.



Heavy losses were suffered in both Great Wars, more than 60 p.c. of the fleet being destroyed in the Second. By 1947, however, all pre-war services had been resumed and a cargo service to S. Africa inaugurated. The head office is in Paris.

Messalina, Valeria (ex. A.D. 48). Roman wanton. Wife of the Roman emperor Claudius and mother of Britannicus, she dominated her weak husband and, with his freedmen Pallas and Narcissus, virtually ruled the empire. Matters came to a crisis when the empress, notorious even in her day for licence, having become enamoured of Gaius Silius, openly married him. Narcissus, fearing for his own position, opened the eyes of Claudius to his wife's character, but only with difficulty did he convince the emperor that the pair were plotting against his (the emperor's) life. Claudius then ordered Messalina to be put to death.



Messalina,
Roman empress
From a coin

Messalla Corvinus, Marcus Valerius (d. c. 1 B.C.). Roman statesman, soldier, and man of letters. He joined the republican party and fought with distinction at the battle of Philippi, 42 B.C. Subsequently pardoned by Octavian, he rendered him valuable services in his struggle to obtain the mastery of the Roman world. Soon after Octavian became the emperor Augustus, Messalla retired into private life. An author of some note, he was a generous patron of letters.

Messenia. Country of ancient Greece, in the S.W. of Peloponnesus, bounded N. by Elis and Arcadia, and E. by Laconia. Its inhabitants were Dorians, with a blend of pre-Dorian elements. The history of the country is largely a long series of wars with the neighbouring Spartans, who conquered it towards the middle of the 7th century B.C. A large portion of the inhabitants emigrated, and the remainder were reduced to the condition of helots. In 464 B.C. they revolted, and after holding out for five years were allowed to emigrate

to Naupactus. After the battle of Leuctra had broken the Spartan power in 371, Epaminondas collected the Messenians from their places of exile and re-established them in their country, founding the city of Messene as their capital. With the Roman conquest of Greece in 146, Messenia became part of the province of Achaia.

Messenia, Kalamata, or Koroni, Gulf of. Inlet of the Mediterranean which indents the S. coast of Morea, Greece. About 25 m. long, it is at the mouth about 35 m. across, and is separated from the Gulf of Laconia on the E. by a peninsula of which Cape Matapan is the termination. The seaport of Kalamata lies at the head.

Messerschmitt, Wilhelm (b. 1898). German aircraft designer. Educated at Munich, he founded his own manufacturing company at Augsburg in 1923. With the advent to power of the Nazi party, his designing genius was allowed full expression, and in 1937 he was elected honorary professor and a member of the war council. The Me 109 single-seat fighter (*see* Aeroplane illus., p. 132) flew in the Spanish Civil War. In April, 1939, a racing version reached the then record speed of 481 m.p.h.; in 1944–45 the standard Me 109G, with full war load, including three 20-mm. cannon and two machine-guns, could attain 428 m.p.h. and fly in action at nearly 40,000 ft. The engine was a Daimler-Benz D.B. 605. Other outstanding Messerschmitt products were the Me 110, 210, and 410, all twin-engined fighter bombers; the rocket-propelled Me 163, fastest aircraft of the Second Great War (over 550 m.p.h.); and the 262 twin-engined fighter, most successful of German jet-propelled machines.

Messiah (Heb. *Mashiach*, one anointed). Title for an expected leader of the Jews, who should deliver the nation from its enemies and secure its permanent triumph and peace. It is equivalent to the Greek word, Christ. The ceremony of anointing was used in O.T. days in the consecration of a man for the office of king, priest, or prophet, who by this ceremony became the representative and agent of Jehovah.

The Messianic idea is implicit in early prophecy, and took definite shape in those of Isaiah and Micah during the period of Assyrian aggression. Its fully developed form dates from about

the period of the Exile. Prophecies of the period indicate that the Messiah should be at once a prince, prophet, and victorious captain. Whether the description of Deutero-Isaiah of the suffering servant of Jehovah refers primarily to the nation or to an individual is much disputed, but in any case the essential idea of world-salvation through vicarious suffering formed thenceforth an element in the Messianic idea. The remarkable fulfilment of these prophecies in the Person and Work of Jesus was put forth early in the history of Christianity as a convincing proof that He was the promised Messiah; hence the universally accepted title of the Christ.

Messiah. Oratorio by Handel. Set to texts from the Bible arranged by Charles Jennens, it was composed Aug. 22–Sept. 14, 1741, and received its first performance on April 13, 1742, in Dublin, for charity. The work has always been held in peculiar affection in England. In three parts, dealing broadly with the prophecy of Our Lord's coming, His passion, and the redemption of the world, it runs through a range of emotions scarcely paralleled in music, allotting to the solo singers (customarily four), the chorus, and the orchestra, the expression of every mood from ecstatic joy to passionate grief. Extra accompaniments have been added by Mozart and others, but now the tendency is to revert as far as possible to Handel's own scoring. *See Hallelujah Chorus; Handel. Consult Messiah, J. Herbage, 1948.*

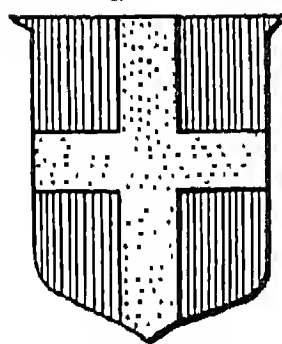
Messianic Hope, THE. Term used in Hebrew and Christian theology. It is applied to the expectation, constantly expressed in the O.T., that a king of the house of David would arise to deliver Israel from oppression; and to the anticipation by Christians of the second coming of Jesus Christ, whom they recognize as the true Messiah. *See Messiah; consult The Jewish and the Christian Messiah, V. H. Stanton, 1886; Messianic Prophecy, C. A. Briggs, 1886.*

Messidor. Tenth month in the year of the French Revolutionary calendar. It began on June 19 or 20, its name meaning the month of harvest.

Messina. Maritime prov. of N.E. Sicily. It is bounded N. by the Tyrrhenian Sea, and separated from Italy on the E. by the Strait of Messina. The surface is wholly hilly, and is traversed by moun-

tain ranges falling N. and E. to the sea, the only rlys. clinging to the coast. The highest point is Monte Sori, alt. 6,055 ft. Messina is the capital, other important towns being Milazzo, Barcellona, and Caronia, all on the N. coast. Products include sulphur, copper, corn, flax, fruit, oil, and wine. Area, 1,254 sq. m. Pop. (1951) 654,254.

Messina (anc. Zancle, Messana). City and seaport of Sicily, capital of the prov. of Messina. It stands



Messina City arms

on the Strait of Messina in the N.E. of the prov., 70 m. N. by E. of Syracuse. The harbour is one of the best in Europe. The town is backed by mountains, and from its streets fine views can be obtained of the Calabrian mainland, as the strait is here only about 2 m. wide. The roads are wide and paved with lava. Always subject to seismic disturbance, and devastated by plagues, Messina has yet remained a handsome and prosperous city. It was almost completely destroyed in 1508 by the disastrous earthquake of Dec. 28, with a loss of 77,000 lives. Some façades of churches and palaces were left. The wrecked cathedral had been founded in 1098, and finished by Roger II. The city was rebuilt; and in 1951 the population was 220,790.

Messina formerly ranked next to Palermo in Sicilian importance. The normal exports are wine, oil, essences, pumice stone, oranges, lemons, and liquorice. Manufactures have included silk, muslin, linen, chemicals, and coral articles. Fishing is important.

Founded about the 9th century B.C., the city was first named Messene by Anaxilas of Rhegium, who occupied it about 490 B.C. It fell successively to Athens, Carthage, and the Mamertines, and became the cause of the first Punic war, Rome capturing it in 241 B.C. It was taken by the Saracens in 830, and by the Normans in 1062. A century later it passed to the house of Hohenstaufen, and late in the 13th century to Spain, which retained it until 1713. British troops occupied the city for several years before the peace of 1814. In 1848 it was taken by Neapolitan troops. From Messina the German cruisers Goeben and Breslau, escaped into the Dardanelles, Aug. 1914.

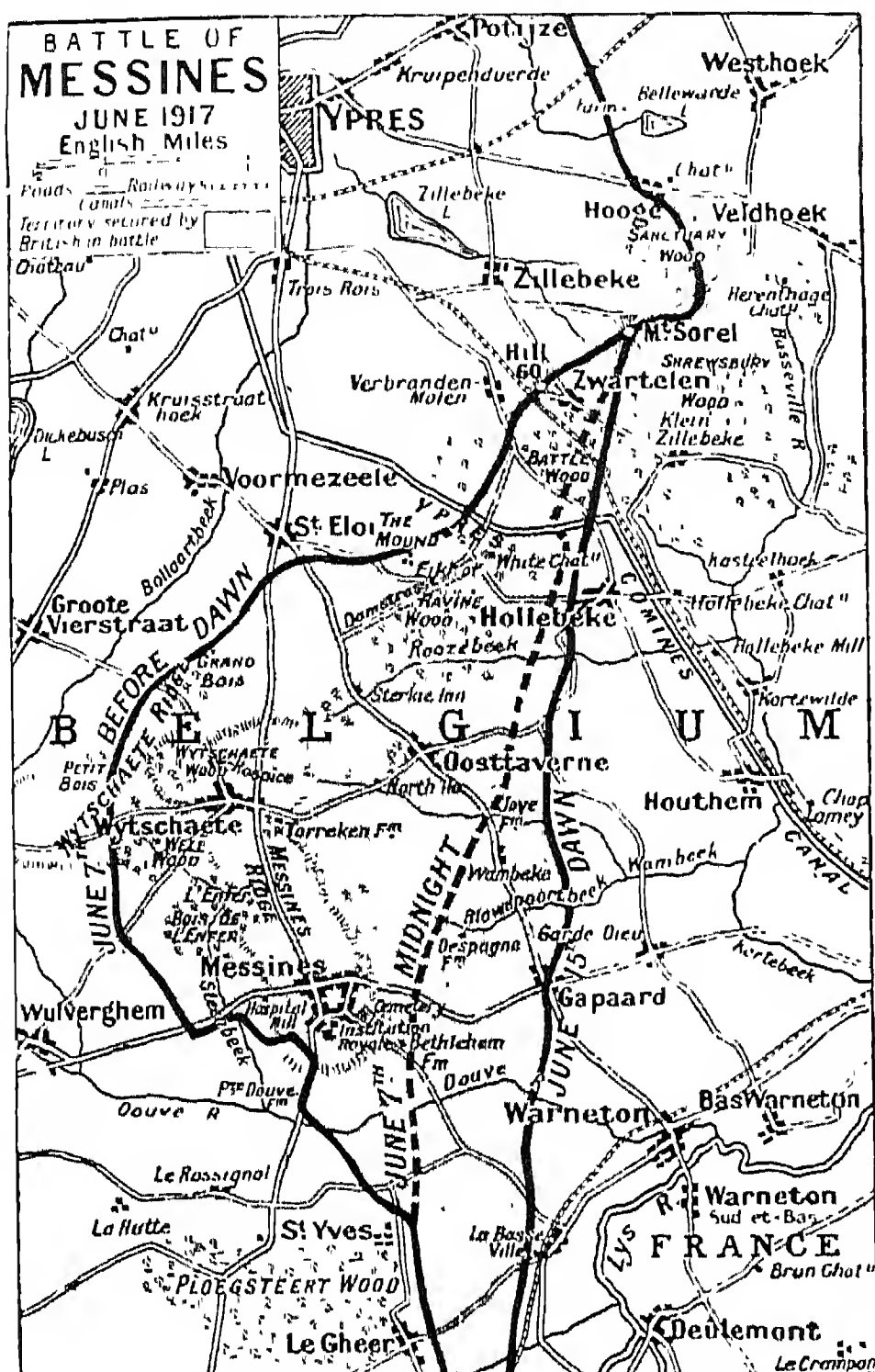
The fall of Messina in the Second Great War marked the end of the

38-day campaign in Sicily. On Aug. 16, 1943, there were simultaneous landings by British forces at Scaletta, 8 m. S. of the city, and U.S. forces near Milazzo, 8 m. to the W. U.S. troops reached Messina that evening, British units joined them early next morning. The Germans had withdrawn to the mainland. The harbour was wrecked, but though the city had been bombed from the air it suffered no other serious damage.

Messina, STRAIT OF (anc. *Fretum Siculum* or *Mamertinum*). Sea passage between Sicily and Italy, connecting the Tyrrhenian and Ionian Seas. About 20 m. in length, its width varies between 2 m. and 15 m. The deep channel and strong current hinder navigation. *See Seylla and Charybdis.*

Messines Ridge. Rising ground in Belgium, N. of the village of Messines, 6 m. S. of Ypres; a prominent battleground of the western front in the First Great War. The village and ridge were seized by the Germans on Nov. 1, 1914, after a two-day stand by the British cavalry corps. Its ruins thereafter dominated the British positions to the W. until the battle of Messines, June 5–15, 1917. The German positions were extraordinarily strong, their line forming a deep salient in the British front, with total length of 10 m., overlooking the British position at Ypres. Forces engaged in that battle were the British 2nd army (Plumer), with 12 divisions, approx. 200,000 men, and the 4th German army (Sixt von Arnim) of 14½ divisions. The British object was to capture the ridge, with the villages of Messines and Wytschaete at the S. and N. extremities respectively, also the second German defence line (Oosttaverne line) well to the E. of the ridge. As a preparation, deep mining was used by the British to an unprecedented extent. Nineteen mines had been driven and charged with explosive many months before. Sappers had tunnelled deeply in the marshy ground beneath the ridge.

A violent British artillery bombardment began May 28, continuing until June 7, while British planes were also active in bombing German communications. The attack began at 3.10 a.m. of June 7 with the explosion of the mines, which changed the entire landscape, creating huge craters. Infantry with 40 tanks then advanced under machine-gun barrage. New Zealanders captured Messines at 7 a.m.; on their right



Messines. Map indicating ground taken by the British in the battle of June 7-15, 1917

the 3rd Australian div. (Monash) reached its objective in 1 hour 40 mins. Wytschaete fell next: and by 10 a.m. the German front line had been taken. In the afternoon the attack on the second line began. Oosttaverne fell after half an hour. By 8 p.m. the German trench system N. and S. of that village was in British hands.

Two German counter-attacks next day were easily repulsed, and the British advance continued for some days, aided by German withdrawals from their positions W. of the Lys (see map). British losses in the battle were 25,000. German losses were far greater, and included 7,200 taken prisoner.

The ridge was held by the British until April 12, 1918, when during the second great German offensive of that spring, they were forced to abandon all the gains of 1917; but was retaken Sept. 30, by the 2nd army in its successful advance during the battle of Flanders. A memorial erected on the ridge commemorates 839 New Zealand soldiers whose graves are unknown. See Ypres Battles.

Messuage (Anglo-Fr. *mesnage*, conn. with *maison*, house). In

English law, the dwelling-house and curtilage, outbuildings, and adjacent land, e.g. the garden surrounding a house, enjoyed therewith. In Scotland it is the principal dwelling-house of a barony. *Pron.* Mess-wij.

Mestizo (Sp. from Lat. *mixtus*, mixed). Half-breed, especially the offspring, and their descendants, of a Spaniard or Portuguese and an American Indian. The feminine is *mestiza*. The term preferred in Brazil is *Mamaluco*; in the central American republics it is *Ladino*. See *Gauchos*.

Meston, JAMES SCORGIE MESTON, 1ST BARON (1865-1943). British administrator.

Born June 12, 1865, he was educated at Aberdeen university and Balliol College, Oxford. Entering the Indian civil service in 1883, he held important posts in the United Provinces, and after acting as secretary to the financial department of the government of India, returned to the United Provinces as lieut.-gov. in 1912. He resigned on appointment as finance member of the viceroy's executive council in 1918. Meston, a strong Liberal, was influential in shaping the Montagu-Chelmsford reforms. On his retirement in 1919, he was raised to the peerage. He published *Nationhood for India* in 1931. He died Oct. 7, 1943, and was succeeded by his son Dougall (b. 1894), barrister and authority on town and country planning.

Mestre. Town of Italy, in the prov. of Venice. It stands on a lagoon, 6 m. by rly. N.W. of Venice, and has a long viaduct over which trains from that city pass. It is an important junction for Vienna, Gorizia, Trieste, and San Giuliano. It has foundries and sawmills. Pop. 11,750.

Mestrović, IVAN (b. 1883). Yugoslav sculptor. Born at Ota-

vice, Dalmatia, Aug. 15, 1883, he was a shepherd boy who showed a talent for carving. Having been apprenticed to a master mason at Split (Spalato), he later studied at the academy in Vienna. He exhibited there from 1902 and in European capitals from 1907, showing 26 pieces of sculpture at Venice in 1914. After the First Great War he lived at Zagreb, where in 1922 he became rector of the academy. In the forefront of ex-



Ivan Mestrović, Yugoslav sculptor

pression of the Slav spirit, his work may be divided into three stylistic periods: early compositions; inspiration derived from archaic Greece, 1907-14; and a phase which showed Byzantine and Cinquecento influences. Although wood was his favourite medium, he used marble, stone, and granite. His chief works include the memorial chapel at Dubrovnik (Ragusa), and a memorial to an unknown soldier at Belgrade. He became a professor at South Bend, Ind., U.S.A., in 1955. See illus. in p. 637.

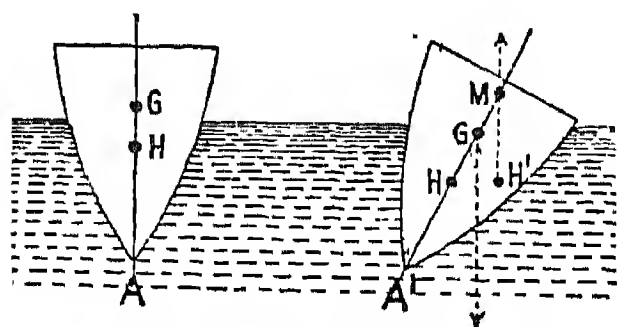
Meta. River and territory (intendency) of Colombia, South America. The river is the chief tributary of the Orinoco. Rising in the Eastern Cordillera, about 40 m. S. of Bogotá, and flowing N.E., it joins the Orinoco after a course of 650 m. From Calabozo it forms the boundary between Colombia and Venezuela. It contains many islands, and is navigable by small steamers at high water for about a third of its course. Meta intendancy is not yet thoroughly organized politically. The chief town is Villavicencio, situated S.E. of Bogotá. Area, 32,900 sq. m. Pop. (1951) 67,492.

Metabolism (Gr. *metabole*, a change). Term embracing all the chemical changes which occur in living tissues. It is divided into anabolism, the building up of tissues from simpler substances, and catabolism, the breaking down of tissues into simpler bodies. In the ordinary healthy individual who is not gaining weight, anabolism and catabolism just balance each other, i.e. the intake of food and oxygen employed in constructive processes neutralise the destructive processes which yield the waste products thrown out of the body in the excreta and from the skin and lungs. In the growing child anabolism exceeds catabolism, and in wasting

diseases or old age catabolism is in excess. See Anabolism; Life.

Metacarpus. The five bones of the hand, which articulate above with the bones of the wrist and below with the fingers and thumb. They are arranged so as to form a shallow arch with the cavity forwards. At their upper extremities, the metacarpal bones terminate in expanded articular surfaces, and at their lower ends in rounded heads, which articulate with corresponding depressions at the upper end of the phalanges of the fingers. See Anatomy; Carpus.

Metacentre. Point of intersection of the vertical through the centre of buoyancy of a floating



Metacentre. Diagram showing the metacentre (M) and centre of buoyancy (H) of a floating body. See text

body with the vertical through the new centre of buoyancy when the body is slightly displaced. If, in the figures, G is the centre of gravity of a floating body, and H the centre of gravity of the displaced water, the two points G and H, if the floating body is in equilibrium, must be above one another. If the body is tilted, then the centre of gravity of the displaced liquid is no longer at H but at some point H'. The point M where the vertical through H' cuts the old vertical through H is the metacentre. If this point is above the centre of gravity of the body, the floating body is in stable equilibrium, the forces acting on it tending to bring it back to its original position.

If, however, M falls below the centre of gravity of the floating body, the equilibrium is unstable. The higher the metacentre, the more stable is the equilibrium. This principle is of great importance in designing ships, which are ballasted so as to keep the centre of gravity well below the metacentre. In complicated structures, e.g. a battleship with heavy gun turrets, the calculations of the positions of the metacentre occupy weeks or months.

Metadyne. A special form of direct current generator or dynamo. It is provided with a second set of brushes operating on a different part of the commutator. By varying the method of connexion and the design of the field magnet

windings, it can be made to act as a constant-current D.C. transformer of variable ratio, or a power amplifier to enable weak "signal" currents to cause very large variations (up to 10,000 times the power) in other circuits. A special form is known as an amplidyne. The metadyne has wide application to traction control in place of plain resistance control, giving faster and smoother acceleration, and allowing power to be fed back to the line when a train is slowing.

Metal (Gr. *metallon*, mine). Any one of the metallic elements. Brass and many other alloys are metals in the commercial sense. The elements are broadly divided into two main classes, the metals and the non-metals, but there is a group of elements which sometimes appear to be metals and sometimes not; these are known as semi-metals or metalloids (*q.v.*). Philosophers throughout the ages have attempted to give complete and accurate descriptions of the metallic group of natural elements. Perhaps the earliest clear definition was given by the Latin writer, who adopted the name Geber; he said, "Metallum est corpus miscibile, fusibile, et sub malleo ex omni dimensione extendibile." This description covers all the metals, even including mercury, which behaves like any other metal when frozen, although in Gebers' time it was not regarded as a metal.

Blumenbach, at the beginning of the 19th century, said that "in strictness, metals should be arranged among combustible fossils" [with sulphur, graphite, bitumen, and diamond]. "They are distinguished however by the following properties. . . . They are the heaviest objects in nature and the most perfectly opaque of all the fossils; they all have the lustre, from that circumstance called metallic; their fracture is generally uneven; and many of them possess ductility. . . . They are rendered fluid by caloric, i.e. they melt. . . . With one or two exceptions. . . all are soluble in nitric or muriatic or nitro-muriatic acids and are most perfect conductors of electricity." Apart from the inaccuracy of the first statement—metals range from iridium and osmium with specific gravities of more than 22 to lithium, which is little more than half as heavy as water—the description is as complete and true as those suggested by later authors. Only a mathematical physicist can give a more precise definition of a metal; he regards metals as an array of positive ions held to-

gether by the attraction of the intervening valency electrons, a conception of the metallic linkage due to Pauling.

Metals themselves differ widely in properties, an example being the range of temps. over which their melting points are spread, from mercury at -38.5°C . to rhenium at more than $3,000^{\circ}\text{C}$. Broadly they may be divided into noble and base metals, the former being resistant to corrosion and to some extent to erosion. In this group are gold, iridium, osmium, palladium, platinum, rhodium, ruthenium, and silver. Division of the base metals may be made into the light metals, aluminium and magnesium; the common metals, iron, copper, zinc, lead, tin, nickel, chromium, tungsten, manganese, vanadium, cobalt, molybdenum, cadmium, and titanium; the liquid metal, mercury; the alkali metals, calcium, strontium, barium, lithium, sodium, potassium, rubidium, and caesium; the semi-metals, arsenic, antimony, bismuth, silicon, selenium, and tellurium; the radioactive metals, radium, thorium, and uranium; and the rare metals, beryllium, cerium, columbium or niobium, dysprosium, erbium, europium, gadolinium, gallium, germanium, hafnium, indium, lanthanum, neodymium, prasacodymium, rhenium, samarium, scandium, tantalum, terbium, thallium, thulium, ytterbium, yttrium, and zirconium. Each is described in this encyclopedia.

Metaldehyde. $\text{C}_2\text{H}_4\text{O}$. White crystalline compound used as a solid fuel. It is produced by the polymerisation of acetaldehyde.

Metal Fatigue. See Fatigue (in metallurgy).

Metallogenetic Epoch. In mining geology, a period in geological time when conditions were favourable for the deposition of useful minerals. A metallogenetic epoch is often short and transitory, but may be of long duration.

Deposits formed by weathering processes and sedimentation are not confined to particular periods in the earth's history, but it is found that deposits genetically connected with igneous rocks are, like igneous activity, often associated with periods of profound disturbance affiliated with folding and mountain building. For this reason prominent metallogenetic epochs occurred in Palaeozoic, Hercynian and Tertiary times.

Metallogenetic Province. Term used in mining geology for an area characterised by a specific type of ore mineralisation. For

instance, the tin-tungsten fields of Malaya, Burma, Siam, S. China, and Indonesia constitute one metallogenetic province; gold, copper, and lead-zinc provinces are found in the U.S.A. and elsewhere. The mineralisation in any one province need not necessarily have been formed during one metallogenetic epoch (*q.v.*), *e.g.* there were two periods of tin mineralisation in the Nigerian province, and three in Australia.

Metallography (Gr. *metallon*, mine; *graphein*, to write). That branch of science which relates to the constitution and structure and their relation to the properties, of metals and alloys. Such a definition embraces micrographic and macrographic examination, X-ray diffraction, X-ray and gamma-ray radiography, electron microscopy, electron diffraction, fractography, ultra-violet light crack detection, physical testing, and thermal analysis. All have been used to enable the metallurgist to understand the behaviour of metals and alloys, and so to improve on their properties and methods of production. The metallographer, who is dependent on the metallurgical analyst for the fundamental knowledge of the composition of the metals or alloys under consideration, examines and tests metals at all stages in production, to ensure that the finished article will perform the duty for which it is designed.

Early iron-founders gained a certain amount of knowledge from the examination of the fractures of broken samples of their product.

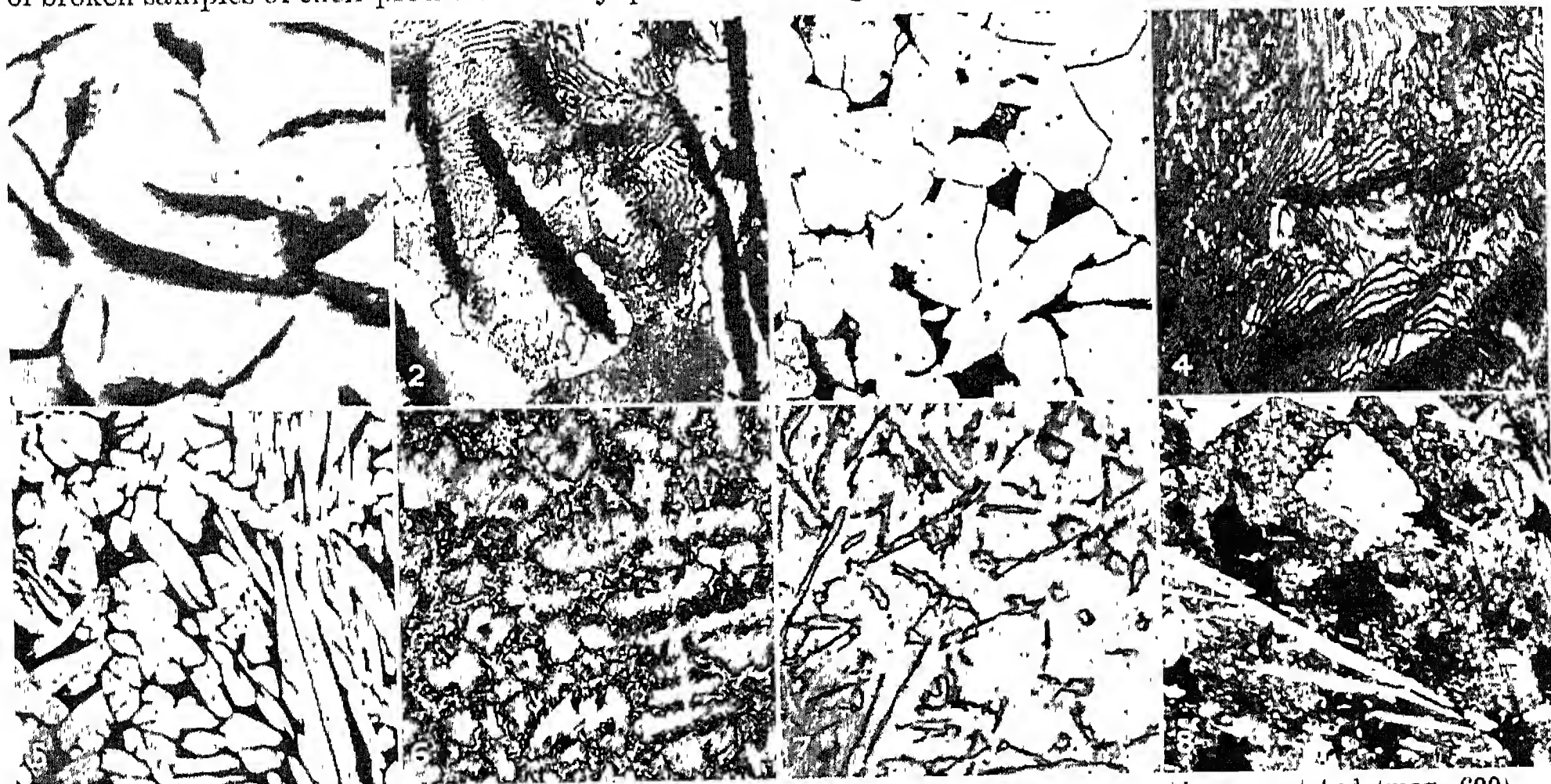
This method, though crude, and relying entirely on the experience of the men working the metal, is still to some extent in use. For example, during the refining of copper, samples of metal from the bath may be cast and broken to determine the "pitch" of the copper. When failures occur during use, the cause can often be ascertained by looking at the fracture. A natural development of this is macrographic examination. This shows mode of solidification of the metal, growth of crystals, non-uniformity of composition due to segregation, physical defects, non-metallic inclusions, method of manufacture (*e.g.* casting or forging), strain in the metal, etc.

In 1861 Henry C. Sorby of Sheffield initiated the systematic examination of metals under the microscope, and followed this by taking photographs of what he saw. Now no metallurgical laboratory can exist without a metallurgical microscope, which differs slightly from the conventional microscope used by doctors and chemists, since instead of transmitted light, it uses reflected light. As metals are opaque, a carefully polished specimen is examined under light introduced into the tube of the microscope and reflected through a right angle by a prism or thin glass slip through the objective lens, which brings it to a focus on the specimen. The light is then reflected back through the objective, this time past the prism or through the glass slip, and so to the eyepiece. Metallurgical micro-

scopes in normal use give magnifications of from 20 to 2,000 times, the higher magnifications necessitating the use of an oil immersion lens. The resolution can be improved at magnifications up to 7,000 diams. by using ultra-violet light. Photography is essential when such light is used as the eye is not sensitive to it.

The specimen is cut so that the part to be examined is reasonably level. The surface is finely ground on a series of emery papers of decreasing coarseness. The specimen is now ready for polishing, which may be carried out by hand or on a small rotating wheel on a chamois leather or cloth with suitable polishing powders. Some of the work in the latter stages can be reduced by polishing electrolytically, after grinding, by making the sample the anode of an electrolytic cell, with an acid electrolyte, often phosphoric acid.

Under the microscope the surface of the specimen will now appear smooth except where there are cracks, non-metallic inclusions, coloured constituents, blow-holes, or other defects. These should be noted before the next stage of the process, which is etching. Under this process, first the boundaries of the grains appear and then various degrees of shading in the different grains. This is because all the grains are not etched uniformly; small facets are formed and the angle of these facets, which are parallel in each individual grain, varies from grain to grain, depending on the orienta-



Metallography. Photomicrograph examples of iron, steel, and some alloys. (1) Grey cast iron, unetched (mag. 600). (2) The same but etched (mag. 600). (3) Mild steel with 0.2 p.c. carbon (mag. 300). (4) Pearlite in a steel, 0.85 p.c. carbon (mag. 800). (5) Alpha-beta brass; 40 p.c. zinc, 60 p.c. copper (mag. 250). (6) Bronze; 85 p.c. copper, 15 p.c. tin (mag. 250). (7) Light alloy aluminium, 12 p.c. silicon (mag. 250). (8) Bearing metal; 80 p.c. tin, 15 p.c. antimony, 4 p.c. copper (mag. 250).

tion of the grain. Thus one grain will reflect most of the light outside the microscope and so will appear dark, while its neighbour may reflect most of it back into the objective lens, thus appearing bright. Also in an alloy the various constituents may etch differently, so that they can be readily distinguished under the microscope (Figs. 1 to 8).

For lower magnifications, a macrosection can be photographed on to a fine-grained photographic emulsion, after which the portions of the photograph which are of interest are enlarged up to magnifications of c. 200 diams.

Microscopic examination is limited to the visible surface of the metal; to understand its internal structure X-rays are used, in two distinct ways. First, castings, forgings, etc., can be examined radiographically to locate inclusions, cracks, and other faults in manufacture. Greater penetration is effected by the use of gamma rays (*q.v.*). But the actual positions of the atoms themselves can be located by means of X-ray crystal analysis or diffraction.

The metallographer gains much of his important information by thermal analysis. Alloys are cooled from above their melting points to room temps., the time and temp. being accurately recorded, so that it can be plotted. If a series of alloys of two metals is treated in this way, an equilibrium or constitution diagram can be drawn,

and from this a great deal of information can be obtained. Electric furnaces and the most accurate pyrometers are used for this work in up-to-date laboratories.

Knowledge of the structure of metals has been greatly extended by the increased application of industrial X-ray technique in crystallography and for analysis and fault detection, and by the advent of the electron microscope. Behaviour of metals under working conditions can be determined by photographing by polarised light models made in transparent plastic while subjected to similar loads. The pattern and formation of the colour fringes in the resulting pictures indicate the magnitude and inclination of the stresses. This technique is known as photoelastic stress analysis. *See Assaying; Copper; Electron Microscope; Etching (Metallurgy); Macrostructure; Microscope; Microstructure; Polishing; Pyrometer, etc.*

Metalloid (Gr. *metallon*, mine). Term sometimes used to describe those elements which exhibit some properties of a metal and some of a non-metal. Zinc, thought by Paracelsus to be a "bastard of the metals," is now known to be a metal. The semi-metals are arsenic, antimony, bismuth, selenium, tellurium, silicon. The division is not scientific, and the description metalloid, sometimes used by chemists and metallurgists, is not generally considered desirable.

been found in later Egyptian graves of c. 3500 B.C., and very well made copper basins and ewers were produced for domestic use by 2500 B.C.

It is likely that the order of discovery of metals was different in different regions. The metals which occur native—gold, silver, copper, iron—are very irregular in their occurrence. Native copper occurs in appreciable amounts in the Lake Superior district of N. America, in Chile, parts of China, Bolivia, Australia, and in Cornwall, England. Silver is associated with the gold. Iron occurs native as meteorites chiefly in N. and S. America, while there is an occurrence of iron of telluric origin in Greenland. But the discovery of the native metals must have affected the Stone Age culture only slightly and no big change would be felt until the art of extracting metals from their ores, melting and casting them was discovered.

Origin of Smelting

It is thought that the original smelting operation was the accidental reduction of a mineral-bearing stone, which happened to be used as part of a ring of stones surrounding a camp fire. A piece of copper carbonate, brown iron ore, or tinstone being heated and reduced in the fire embers would produce a small lump of metal. It would be a relatively simple step to make an open furnace for the express purpose of producing what must have seemed a very desirable material to the man who, until then, had had nothing but stone to work with. Bronze was probably produced accidentally in this way, owing to the close association of copper and tin ores, and this started the great Bronze Age, which is thought to have begun in Egypt and Western Asia about 3500 B.C. and to have reached Central Europe by c. 2000 B.C. The first simple furnace would be just a fire with a small cavity in the hearth of the fire to receive the molten metal. Such crude furnaces were still in use in Japan at the end of the 19th century and may still be seen in use in parts of Africa.

Small objects of meteoric iron are occasionally found in predynastic graves in Egypt, and iron ores were occasionally worked in Mesopotamia during the third millennium B.C. Early iron was not cast, as furnaces that would attain the high temperatures needed were not available, but was wrought, by heating the ore with a reducing agent and then

METALLURGY: WORKING OF METALS

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The history of metallurgy, and some general account of the methods used from time to time in the extraction of metals from their ores, are given here. For specific details, see under the various metals, Copper; Gold; Iron, etc. See also Blast Furnace; Cyanide Process; Ferro-Alloys; Flotation; Mineral Dressing; Powder Metallurgy

John Percy, professor of metallurgy (Gr. *metallon*, mine, *ergos*, worker) at the royal school of Mines in the middle of the 19th century, described metallurgy as "the art of extracting metals from their ores and adapting them to various processes of manufacture." His definition is true today, although the scope of the metallurgist's activities has widened enormously since that time until today it is almost impossible to name an article during the manufacture of which some metal-containing implement has not been used.

The art of metallurgy has been practised by man from his earliest days. The only source of knowledge of early metallurgy, however,

is the objects and articles brought to light by the excavations of archaeologists. Gold was almost without doubt the first metal to be discovered and used, chiefly as an ornament. It is probable that late Neolithic man discovered metals and so became the first metallurgist. Evidence has been found that indicates the existence of the art at least 6,000 years ago. One of the oldest surviving products of the metallurgist is a copper pin, now in the British museum, probably used for the fastening of a goatskin over the shoulders of its owner. This, found in a predynastic Egyptian grave, is probably more than 6,000 years old. Cast copper weapons have

hammering out the pieces of slag. Chance conditions may allow steels to be produced in this way, and the Hittites mastered this technique not long after 1400 B.C.; by 1000, the iron industry had spread to Europe. Beautiful Damascus blades were made before the time of Diocletian, c. A.D. 300, of steel whose quality is scarcely equalled even today. There are some indications that iron may have been cast as much as 2,500 years ago, perhaps first in China.

The Greeks, the Etruscans, and the Romans were great metal workers, using gold, silver, copper, iron, and lead with considerable metallurgical knowledge and a very high degree of manipulative skill. The Greeks developed the ingenious Egyptian *cire perdue* (lost wax) process for casting their hollow bronze statues. Probably at no other time in history have the arts of sculptor and metallurgist been so happily blended.

Throughout the Christian era until about 1800 the chief developments related to improvements in the methods of producing iron and steel and increased scale of operations. Among the great names of the 19th century are Dud Dudley, Huntsman, Darby, Cort, Neilson, Bessemer, Siemens, Thomas and Gilchrist, Bell, Hadfield, and Harvey. More recently, particularly since 1900, rapid advance has been made in the production and use of non-ferrous metals, the discovery and isolation of new metals, the introduction of light alloys, etc.

Contemporary metallurgical industry may be divided into two main branches, mining and extraction metallurgy, and physical metallurgy; each of these is again divided into the non-ferrous and ferrous industries, and all fields involve both plant operation and laboratory work. The various subjects overlap, the extraction metallurgist trying to produce the metal in the form most acceptable to the physical metallurgist, and the latter putting the findings of his research at the disposal of the extraction expert. Nevertheless, although each is dependent on the other, there is, owing to over-specialisation, a tendency for each branch to overlook the findings and desires of the other. In highly industrialised Great Britain, there is a natural tendency to concentrate more on physical metallurgy, dealing with the properties and processing of metals and alloys in the later stages of production, except so far as iron and steel are concerned. This is because she

has few natural ores available, most even of her iron ore being imported. In spite of this, very many of the extraction industries in the Commonwealth and Empire and elsewhere have been developed and are supervised by metallurgists from Great Britain, who have a reputation still to be equalled.

The metallurgist's work starts before the ore has been mined, for, once an ore deposit has been located by the geologist, the metallurgist plans how the ore can most economically be treated for recovery of the metals. Many ores are not of a sufficiently high grade to be smelted direct; or they contain some impurity which must be removed before the ore can be treated. This need for the ore to be treated direct led to the industry known as ore dressing. At one time this consisted almost entirely of crushing the ore to a sufficiently fine grade to make possible the separation of the metallic particles by gravity or the picking out by hand of the richly mineralised portions of the ore as they came up from the mine. Such methods are still used for ore concentration, and various shaking tables, jigs, and strakes have been designed, the principal metal to be extracted in this way being gold. This metal occurs native in ores and, being heavy, is easily separated, the gold that is left after gravity treatment being subsequently extracted by cyanidation. By means of flotation many ores previously considered too poor in quality to be worth handling can now be used.

Methods of Extraction

Methods used for extracting the non-ferrous metals depend upon the chemical properties of the metals and upon their mode of occurrence in the ore. Smelting is commonly employed for the extraction of lead, tin, copper, and nickel, although the metal produced very often needs further refining before it can be used industrially. Final refining may be carried out by fire methods, similar to the extraction process, or else by electrolysis. Gold and silver also can be refined electrolytically, although they and the platinum metals can be purified by chemical treatment. Electrolysis is used in the extraction of aluminium and magnesium, and of various of the less known metals such as lithium, calcium, sodium, and potassium; but the methods used are really a combination of thermal and electrolytic processes, the electrolysis being carried out in a molten bath of various salts of

the metal concerned. Distillation is used for certain metals, notably zinc, cadmium, mercury, arsenic, and antimony. Nickel, after a preliminary extraction by smelting to a matte, containing its sulphide in association with that of copper, can be refined electrolytically or by a famous process evolved by Mond, in which the nickel is volatilised as a carbonyl. Vacuum distillation is being developed for the recovery of a number of the rarer metals, such as beryllium, barium, niobium, cerium, germanium, indium, tantalum, and zirconium, previously unobtainable in a pure form.

Ferrous Metallurgy

Ferrous metallurgy is concerned entirely with the production of iron and steel and the allied metals manganese, chromium, tungsten, molybdenum, and vanadium. Iron ores are treated, usually without concentration, by direct smelting with suitable fluxes in a blast furnace. These run continuously for months on end, producing thousands of tons of pig iron for each campaign. The pig iron is far too brittle for use as it is and it is made either into cast iron by melting in a cupola or else into steel. Steel can be made in converters by the process of Henry Bessemer, in open hearth furnaces by the processes of Siemens and of Thomas and Gilchrist, or in electric arc furnaces, usually of the Heroult type. By suitable control of composition and heat treatment, steels can be made with widely differing properties, and the other ferrous metals are used for making alloy steels for special purposes. These metals are usually added in the form of their ferro-alloys; they are manufactured either in electric arc furnaces or in special blast furnaces. Wrought iron can be produced direct from the ore.

The metallurgical industry in the U.K. is connected chiefly with the manufacture and the working of metals and alloys. Non-ferrous and iron foundries exist in all parts of the country and certain areas are associated with the production of tubes by extrusion and rolling, sheet and strip by rolling, wire-drawing, rail-making, all forms of casting and forging. Tinplate is produced in S. Wales, where the continuous strip mill is of increasing importance, and all forms of iron and steel are produced in the Midlands and N. of England and in Scotland. Aluminium and magnesium are not only extracted from raw materials, but their alloys have been developed and manufac-

tured widely, in particular in connexion with the aircraft industry. Copper is drawn into wire and cable for the electrical industry and also alloyed with zinc and tin to make brasses and bronzes. Lead and tin alloys are made into bearings, and considerable quantities of gold, silver, and the platinum metals are refined and made into jewelry, scientific instruments, and apparatus, and into coinage at the royal mint. The shipbuilding industry uses nearly every branch of the metallurgical industry, but particularly steel. There are also a number of small specialised industries which involve careful and accurate control, such as the manufacture of springs, bearings, and tools. Many of the last-named are now made from tungsten carbide by one of the many processes used in powder metallurgy. Here the metal is obtained in powder form and compacted into the shape desired, a sintering process producing a homogenous solid which has never been melted.

All these processes require much control and development. Control is effected chiefly by the industries themselves, which contain individual laboratories for routine testing and metallurgical analysis. Many industrial concerns also run research laboratories, which are chiefly engaged on development of methods of metal treatment. Metallurgical research uses not only the more common forms of mechanical testing, microscopy, and analysis, but also the spectrograph, X-ray diffraction, X-ray radiography, electron microscopy, and absorptiometric and polarographic analysis. Research organizations include the British non-ferrous metals research association, the British iron and steel research association, and the British welding research association. Fundamental metallurgical research is carried out chiefly by the National Physical Laboratory, and by the metallurgy departments of the universities and technical colleges. Two qualifying societies, the Institution of Metallurgists and the Institution of Mining and Metallurgy, issue certificates to students unable to sit for degree examinations.

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Metal Powder. Metal prepared in powder form. Many articles are of such intricate shape and pattern that to forge or cast them is impracticable. Therefore, metal powders are pressed into shape and then sintered, so as to become solid without fusion. These powders are usually prepared by direct reduction of the metallic oxides or salts, or by various electrolysis processes, *e.g.* in the U.S.A. in the manufacture of copper wire for the electrical industries. The metal powder is made by electrolysis in a normal cell, at abnormally high current density. The copper so formed is spongy and, after drying, can be readily broken into small particles, which are then heated without melting and extruded into a continuous wire. Gears made from metal powder can be produced more cheaply than those forged and machined from bar metal. *See Powder Metallurgy.*

Metals, INSTITUTE OF. Organization founded in 1908 to promote the science and practice of all branches of non-ferrous metallurgy. The institute, which is international, both in membership and in activities, is governed and administered by a council, representative of the several groups in its membership. Publications include the monthly journal and metallurgical abstracts, the quarterly *Metallurgical Review*, and a series of monographs on metallurgical subjects. The h.q. is at 17, Belgrave Square, London, S.W.1.

Metal Spraying, OR METALLISATION. Method of protecting metal parts of, *e.g.* bridges, ships, pylons, from corrosion by air or sea water. Certain metals, *e.g.* zinc, aluminium, tin, have a greater resistance to corrosion than others. Heated particles of these more resistant metals are forced by means of a compressed air pistol on to the object to be coated. The particles flatten and coalesce on hitting the surface against which they are forced, and form a thin, coherent layer. The metal is introduced into the pistol as a wire or powder, and any metal obtainable in these forms can be sprayed. The coated surface can

be left exposed or painted. Tests on the Forth bridge have shown that repainting is needed much less frequently on parts that have first been thus sprayed.

Metamorphism (Gr. transformation). In geology, the alteration of rocks by heat, movement or pressure, and permeating solutions within the earth's crust. The altered rocks are known as metamorphic rock. In the U.S.A. the term metamorphism is sometimes used to include rock weathering. Regional metamorphism is the alteration of rock masses over large areas during mountain building movements. In the upper crustal layers simple folding and compression occur, which promote the development of slates and, locally, phyllites: a phase known as dynamic metamorphism. At greater depth, shearing of the rocks or rock-flow becomes more prevalent, and the movement is accompanied by penetration of heat and solutions derived from still deeper zones in the crust. The combined effect is to cause recrystallisation of the rocks, and platy or elongated minerals (micas, amphiboles, etc.) develop along planes of shearing or bedding. In this way schists are formed. With further introduction of material from below, schists grade into gneisses and may eventually be so far changed as to become granite or granite-like. Stages of progressive metamorphism are termed grades, and are recognized by the formation of certain minerals—chlorite, biotite, garnet, staurolite, kyanite, sillimanite, in order of increasing intensity—in rocks which were originally shales.

Thermal or contact metamorphism is a more restricted form of rock alteration found around, and in contact with, intrusive rock masses of igneous origin. The heat from the igneous rock has caused recrystallisation of the rocks to take place in an aureole around the intrusion. Those rocks which are least altered, on the outer edge of the aureole, show only incipient growth of new minerals which can be seen as spots in rocks which have become slightly hardened by the heat. Closer to the intrusion, where the effect was greater, these spotted rocks grade into very hard, tough rocks known as hornfelses. Metamorphism of lime-rich rocks leads to the development of marbles or of calc-silicate hornfelses. Alteration of basic lava flows and tuffs produces hornblende and garnet bearing rocks (amphibolites). Eco-

nomie ore deposits of copper, lead, zinc, iron, etc. are often associated with thermal metamorphism, especially when the country rock is limestone. *See* Geology; Rocks. *Consult* Metamorphism, A. Harker, 1932.

Metamorphōses (Gr., Lat., transformations). Name of two Latin works. The first, written in Latin hexameters, by Ovid, contains examples of legends and myths, from the earliest times down to the reign of Augustus, which are connected with changes of shape. The second, by Apuleius of Madaura, better known as the Golden Ass, is in prose, and gives an account of the transformation of a certain Lucius into an ass, his various adventures, and restoration to human shape. *See* Ovid.

Metamorphosis. Zoological term which refers to any major change in the form of an animal during its development. Many insects, crustaceans, molluscs, and sea urchins exhibit the phenomenon. An insect such as a butterfly hatches from the egg as a caterpillar which, on becoming fully grown, passes through a quiescent pupal or chrysalis stage to become a typical winged butterfly. Many molluscs have a larval form, free swimming in the sea, which metamorphoses to become an adult crawling on the sea bottom or burrowing in mud. Among the vertebrates the frog provides a familiar example. The change of form from a tadpole to a frog is brought about by a hormone secretion from the thyroid gland

which increases in size until sufficient to initiate the metamorphosis. The change of form in insects is also thought to be controlled by a hormone secretion. *See* Insect; Larva.

Metaphase. Cytological term for the stage in nuclear division when the chromosomes are arranged at the equator of the nuclear spindle but their longitudinal halves have not yet started to separate to the poles. The chromosomes are usually well spread out across the cell at this stage; hence an end-on view is usually chosen for chromosome counts.

Metaphor (Gr. *metaphora*, transference). Figure of speech. A term is used in a connexion where it cannot apply literally, but only by virtue of some analogy. It differs from simile in that no comparison is expressed. To say that a man is as steady as a rock is simile; to speak of the bedrock of his character is metaphor, the two being identified, not compared. Images which are constantly used lose their metaphoric force and often pass into common speech as terminology for mental states and abstract ideas; words like enlighten and revolution (political) began as metaphors. There is a stage at which the metaphor is partially accepted in this class, and here one should beware of mixing metaphors with ludicrous effect, as when politicians talk of ironing out a bottleneck. Hamlet's famous "take arms against a sea of troubles" is clearly understood, yet a mixed metaphor.

a Greek phrase meaning "the things that come after (*meta*) the physics," and was attached to certain compositions of Aristotle more than two centuries after his death (322 B.C.), either because his editor placed them after the writings called "the Physics," or because he considered they should be studied only after the Physics had been mastered. The origin of the name thus gives no information about the nature of the subject so named. Aristotle himself referred to it only as First Philosophy or Theology. The aim of this science, which has the most general of all possible subject-matters, is, he says, the study of Being *qua* Being, or of that which is, in so far as it is. Each "departmental" science may be differentiated, classified, and described by reference to the objects or field of subject-matter special and proper to it, the nature of its appropriate data determining the extent and the character of that science. Thus, spatial magnitudes and shapes together constitute the subject-matter of geometry, the geometer being concerned with no other characteristics of "what is."

Again, those characteristics and modes of behaviour and change of many physical existences on account of which we name them plants or vegetable organisms form the special subject-matter studied by the botanist. In like manner metaphysics has its special and proper domain, for it directly and exclusively treats of that which is most general and most ultimate in all things or realities whatever (namely, that they *are*, or *are beings* or *existences*). As the science of Being as such, its subject-matter is more universal than that of any "departmental" science.

The first task of "First Philosophy" is to elicit the irreducibly different kinds of the real about which there can be discourse and knowledge. Of these modes of being (named substance, quality, magnitude, relation, etc.), the most ultimate is substance; hence the main investigation is concerned with its analysis and its causes. Two quite different questions may be raised about any substance (*i.e.* any concrete individual thing): What are the factors composing it? How did the individual so composed come to exist and to exhibit the nature and behaviour characteristic of it?

In answering, Aristotle employs two very pervasive antitheses, manifest throughout nature; namely, (1) form and matter; (2) potentiality and actuality. In every individual, two composing factors

METAPHYSICS: THE SCIENCE OF BEING

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This article is one of a group that includes Logic; Philosophy; Relativity. See also Idealism; Mind; Ontology, etc.; and biographies of the great metaphysicians, e.g. Aristotle; Berkeley; Hegel; Kant; Locke; Plato; Spinoza, and others

The name metaphysics, like the names of other sciences, is used to designate both a range of inquiries or problems and a body of conclusions which compose, at least tentatively, the sum of knowledge about the field of objects upon which those inquiries bear. In current popular usage the name carries only a vague, indeterminate signification; its scope and its aim are often not distinguished from those of philosophy. But the history of these subjects justifies, and our convenience in their pursuit favours, our distinguishing them. To try to establish a hard and fast division between them would raise endless controversy, but we may begin by regarding the scope of

philosophy as the wider, since it includes problems and doctrines pertaining to ethics and aesthetics, and these are not usually held to fall within metaphysics. Yet they have metaphysical implications, and the treatment of these inevitably leads, in proportion to its exhaustiveness, to a study of questions and principles that are metaphysical.

Provisionally defining metaphysics as the systematic study of the ultimate nature of all that is real, we may best elicit the special character of the science from (1) its earlier history: (2) its modern and contemporary position.

ARISTOTELIAN METAPHYSICS. The word metaphysics comes from

are united ; its matter (the stuff, or that of which it is constituted or made) and its form (that unity of structure and quality that is special to it, differentiating it from individuals of all other kinds). Every substance is thus an instance of some determinate form informing or organizing some matter. The two are inseparably united, but distinguishable, in the thing. They are also correlative, for that in the substance which is called its matter is so called only relatively to the form by which it receives further determination. By means of the second antithesis Aristotle passes from the restricted conception of the substance as constituted at one particular moment in its existence, and accounts for the course of its changes, growth, or development throughout its whole history—from an immature or less perfect condition to one mature or more perfect.

Aristotle's Four Causes

Both antithetical principles are brought together in his doctrine of the four causes. These are intended to explain at once both constitution and development respecting any substance, by indicating that from which it becomes, the law of its growth, the agency to which its changes are due, and the "mature" or approximately perfect character which the developing individual finally realizes, and after which it merely degenerates. Every natural process reaches a stage in which the form (which at first was only potentially present in the substance, or in the agent working upon it) is fully actualised in the matter within which that process was initiated. All varieties of process (generation and corruption, qualitative alteration, quantitative increase and decrease, locomotion) converge to promote eventually the same result : the production of fresh form in matter previously otherwise formed. The world process is continuous and eternal, and Aristotle's account of its unchanging source culminates in his Theology.

Inquiries of this character, however, originated not with Aristotle, but with the Pythagoreans and Parmenides, some century and a half earlier. Plato, too, though largely occupied with ethical and social problems, found himself also compelled to treat these more ultimate questions on which the rest of his philosophy depends. His theory of ideas (also called universals and forms) is pure metaphysics, even though he never applies that name to it. For it is these ideas or forms in their hierarchical order which

constitute the real in its ultimacy and perfection, and not the particular things in the temporal world apprehended in sense-perception.

MODERN AND CONTEMPORARY METAPHYSICS. Subsequent history of philosophy to our own times reveals an almost unbroken continuity and pertinacity in the study of these ultimate problems. After Plato and Aristotle, the greatest names are Plotinus, Aquinas, Spinoza, and Hegel ; while somewhat less in intrinsic importance if not in influence were Descartes, Malebranche, and Leibniz. Locke, and more so Kant, approached these questions from a new angle. They insisted on the priority of problems concerning the limits of possible knowledge over those about the ultimate character of reality.

Kant considered his discovery of the conditions under which knowledge was possible provided the key to all problems that could reasonably be supposed soluble. So knowledge, and not being, now becomes the primary subject-matter of metaphysics ; and epistemology (or theory of knowledge), not ontology, is conceived to be the metaphysician's proper concern. By eliciting what is implied in the very fact of our having knowledge at all, the range of problems that can legitimately be raised and profitably be treated is determined. The only knowledge possible is that which is of phenomena and their relations (*i.e.* appearances). Of a reality that transcends them, and of which phenomena are the appearances, our minds are permanently incapable of knowledge. So Kant holds that the attempts of previous metaphysicians to understand things as they are in themselves independently of their appearances to cognizing minds should be abandoned in favour of his philosophy, promising an understanding of phenomena.

Empiricism and its Opponents

From this limitation of the range of the knowable, which Hume had adopted as a convenient postulate but Kant declares to be an ineluctable necessity due to the constitution of our minds, derives much that is found in the phenomenalist, positivist, and pragmatic philosophies of the last hundred years, as well as in the anti-metaphysical programme of the contemporary "logical positivism" and "analytical empiricism" whose best known exponent in Great Britain is Bertrand Russell.

In strong reaction against what they regard as arbitrary and rationally unwarranted curtailments

of later empiricism stand such thinkers as F. H. Bradley, J. Ellis McTaggart, and H. P. Hallett. For the two former, the main issue concerns the relation of appearance, in all its forms, to reality. The different conclusion of each depends on criticism of the various characteristics that reality appears as having, from which it is sought to determine what nature and structure the existent really can have. Besides differentiating apparent characters from the ultimate characters of what exists, McTaggart tries also to show *how* the existent, having such an ultimate nature, *can* delusively appear to be so differently characterised.

Hallett, regarding all forms of empirical philosophy as "phenomenology masquerading as metaphysics," defines the latter as "the science of the eternal Real as it is in and to itself," and phenomenology as "the science of the appearances of the Real in and to its own parts." Phenomenology is a form of philosophy natural to the special scientist, and in so far as it is coherent it is justifiable as an approximation to the truth. But it is always subject to more ultimate metaphysical criticism. In particular, Hallett believes, it is the acceptance of time or duration at its face value—as being an ultimate fact or character of the real, instead of the uncriticised empirical datum that it is—which condemns all empirical philosophies to metaphysical inadequacy.

UNITY AND PLURALITY. The character of metaphysics may be further understood by reviewing the solutions that have been proposed to one of its central problems. The whole truth about what exists cannot consist in the single truism that it exists. It should be possible to pass to further truths about its ultimate form, so discovering what kinds of unity render it orderly and coherent, hence amenable to our understandings. Now the limited range of the real to which we have access in perception exhibits at least an apparent plurality. The universe comes to be conceived in consequence as being really a "many," in (a) being qualified by a vast variety of characters ; (b) comprising innumerable distinct existences. Is the universe *really* a "many" in both these respects, independently of the appearances of its parts to particular minds, or is it not ?

That reality is of the same ultimate nature throughout is the answer of monism ; that there are two irreducibly different natures,

one possessed by some, the other by other existences, is the answer of dualism. Examples of the former are the materialism of Hobbes, the spiritualism of Berkeley, and the monadism of Leibniz. Descartes, affirming the ultimacy and the irreducibility of mind and matter, illustrates the dualistic answer.

The solution to the question in the second respect turns upon what dependency and what independency there is respecting the parts of what exists and the whole they together make up. One answer is that there is no dependency whatever, each existing thing or part being autonomous, depending on no other to be what it is. On this view, all relations between terms are extrinsic or external to them, and the world, in consequence, is simply a series or assemblage of particulars, some co-existent, others sequent in time. Such a pluralistic answer was returned by Hume. Another answer runs that what exists comprises (1) innumerable finite existences, each depending upon some other for its being; (2) that which depends upon nothing else, but is independently existent. Spinoza's metaphysic of a single infinite Substance, uncreated and uncaused, of which all particular things are parts or "modes," is an example. It is monistic in respect of existence, but pluralistic in respect of ultimate nature (or essence), since every part or mode is at once both physical and mental; and these natures are not merely apparent, but also ultimate expressions of the real. Conversely Leibnizian monadism is pluralistic in the former respect, and monistic in the latter, since it maintains that reality comprises an infinitely large number of existences each independent of any other. No two, however, have exactly the same nature, but the natures of them all are differentiations of one ultimate "kind," namely, spiritual or conscious activity.

Interpretations tending towards conclusions of each type, monistic and pluralistic, have their particular merits and their special dangers. Unpractised and uncritical thinking usually adheres to an elementary form of dualism, supposing some existences to be ultimately mental (minds or selves) and others to be really physical (our own bodies or non-human bodies). But the easy credibility of this view is compromised when the dualist is required to explain the apparent interaction between our bodies and our minds. So, in pursuing one prob-

lem, fresh problems are found to arise. Similarly, an over-hasty decision upon one problem, taken in isolation from others which, though really connected with it, have yet not been considered along with it, may prejudice our findings upon those others.

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Metapontum. Ancient Greek city in Italy. It stood on the Gulf of Taranto at the mouth of the river Basento. Founded by colonists from Achaea about 700 B.C., it was famous as the home of the philosophical school of Pythagoras after its removal from Crotona.

Metascope. An infra-red ray device developed by the Allies in the Second Great War to assist or detect troop movements at night. An infra-red source projected a light beam which could be picked up visually only by the metascope. It was used extensively by parachute troops to guide them to the assembly point after landing. The metascope could itself project infra-red rays which, striking an object invisible to normal vision, were reflected back to the instrument. See Infra-red Radiation.

Metasomatism. Chemical process operating in rocks and mineral deposits whereby the original mineral composition is changed by the action of circulating solutions. In nature solid minerals are continually being acted upon by solutions. These solutions may be of meteoric origin (see Meteoric Waters), such as rain water, and penetrate to some distance below the surface. Or hot solutions which are of deep-seated origin may ascend and flow along fissures and soak into the adjoining rock. Minerals are attacked to various degrees by these solutions, being decomposed or dissolved. New minerals may be deposited in the open spaces. If the attacking solutions are moving along minute openings, and deposition of new material keeps pace with the solution of the old, then new minerals may grow by replacement and frequently retain the structure of the original rock.

Whole ranges of granite hills have been formed by the metasomatism of sedimentary rocks by "granitising solutions"; quartz, feldspar, and mica growing by replacement of the original clays,

mudstones, quartzites, schist, etc. Metallic ores are often formed by replacement. Massive deposits of lead and zinc sulphides have been put down in place of dolomites and limestones. Tourmaline, mica, chlorite, and quartz may grow by replacement in the wall rock. The development of sericite is a common type of wall rock alteration.

Metastasio, PIETRO (1698-1782). Italian poet and dramatist. Born at Assisi, Jan. 13, 1698, he was the son of a Neapolitan drug-gist whose surname was Trapassi. Pietro was discovered as a brilliant improvisator by a wealthy man who grieved his name into the form by which it is known, and in 1718 left him a fortune. This he soon dissipated, and then articulated himself to a lawyer in Naples. In 1721 he wrote a masque, Gardens of the Hesperides. Dido Abandoned, 1724, was more successful. In 1729 he was appointed court poet at Vienna. He had written 28 grand operas besides many shorter pieces when he died April 12, 1782.

Metatarsus. That part of the skeleton of the foot which lies in front of the tarsus or instep bones. The metatarsal bones form the front pillar of the longitudinal arch of the foot, the back pillar being formed by the heel. Each bone has a somewhat square base attached to the tarsus, and a rounded head which in walking comes into contact with the ground at the ball of the foot. Each bone forms the basis of attachment for its corresponding toe, the phalanx of the latter articulating with the rounded end of the bones. The metatarsus arches the foot from toe to heel, and from side to side, forming the instep.

Metatheria. Zoological term for a sub-class comprising the Marsupials (*q.v.*), or pouched mammals, of which the kangaroo is familiar. These animals bring forth their young in a very small and rudimentary state, the later stages of development taking place in the mother's ventral pouch.

Metaurus. River of Umbria, Italy, the modern Metauro. Here Hasdrubal, the Carthaginian general, was defeated in 207 B.C. by the two Roman consuls Gaius Claudius Nero and M. Livius Salinator, while bringing much needed reinforcements to his brother Hannibal (*q.v.*). This was a decisive battle in the second Punic War, the Roman victory extinguishing Hannibal's last hope of overthrowing Rome.

Metaxas, JOHN (1871-1941). Greek statesman and soldier. Born in Ithaca, April 12, 1871, he was



John Metaxas,
Greek statesman

educated at military schools in Greece and Germany. Commissioned in the infantry, he fought in the unsuccessful Thessalian campaign against Turkey in 1897. In 1903 he became professor at the Greek military academy; later joined the general staff, serving with distinction in the Balkan Wars of 1912-13; and in 1915 became chief of staff and King Constantine's closest military adviser. When Venizelos intervened on the Allies' side in the First Great War Metaxas resigned. He also opposed plans to establish Greece in Asia Minor before the destruction of the Ottoman empire. On the fall of Constantine, Metaxas went into exile in Italy, and in 1920 was condemned to death *in absentia* for his alleged surrender of Fort Rupel to Bulgaria in 1916. The sentence was quashed after the restoration late in 1920, and he returned to Greece, though he played no part in the Anatolian war.

After periods of office and exile, Metaxas joined the government in 1935 as minister without portfolio. On the restoration of George II, in 1936 he became premier, declared himself chief of state, and proceeded to establish a totalitarian regime, which aimed at reviving the ancient Spartan traditions of simplicity and physical fitness. His foreign policy was prudent, but while strictly neutral at the outbreak of the Second Great War, he could not organize a Turko-Balkan combination against Axis aggression. When Italy attacked Greece in Oct., 1940, Gen. Metaxas was primarily responsible for military successes in the campaigns in Albania, and was the first Allied general to defeat the Axis in Europe before he died on Jan. 29, 1941.

Métaye: System (late Lat. *medietas*, moiety, half). System of land tenure. It is derived from a Roman custom by which certain cultivators paid to the *dominus* (landlord) a fixed proportion of the annual crop. The system is still common in Italy, France, Portugal, W. Indies, etc. In France the landlord supplies, not only the land, but also stock, implements, etc.,

while the *métayer* provides his own and hired labour, and the resulting profits are divided between the two. The system provoked much discussion among political economists in the early 19th century.

Metazoa. Zoological term. It is applied to all multicellular animals except for the sponges (parazoa), which probably have an evolutionary origin distinct from the metazoa. The metazoa may be considered as animals possessing a number of cells, each containing a single nucleus, which become specialised for the various functions of life into distinct organs, e.g. the digestive, nervous, or reproductive systems. Even the simplest metazoa possess an internal cavity lined with a special layer of cells, the endoderm. In contrast to the metazoa there are the protozoa (*q.v.*), a group of animals living as individual cells with one or many nuclei, and carrying out all normal living functions.

Metcalf, JOHN (1717-1810). A British road-maker. Born at Knaresborough, Yorks, Aug. 15, 1717, when six years old he lost his sight as a consequence of an attack of smallpox, and became known as Blind Jack of Knaresborough. Despite his infirmity, he took up horse-dealing, being an excellent judge of horseflesh entirely by touch. In 1765 he obtained the contract to construct a road between Minskip and Fearnby and later built a bridge at Boroughbridge. The soundness of his work led to his continuous employment as a road-maker for more than 30 years, some 180 miles of turnpike being constructed by him, chiefly in Yorkshire. In road construction and bridge building he was a chief predecessor of Telford and Macadam. He died at Follifoot, near Knaresborough, April 26, 1810.

Metcalf, CHARLES THEOPHILUS, BARON (1785-1846). British administrator. Born in Calcutta, Jan. 30, 1785, he was educated at Eton, and in 1800 was appointed to a writership under the East India co. He occupied various important positions in India, and was provisionally appointed governor-general in 1835. His removal of the restrictions then imposed on the Indian press brought him into some disfavour, however, and in 1838 he retired. Governor of Jamaica from 1839 to 1842, he was appointed governor-general of Canada in 1843, but ill-health compelled his retirement in 1845, when a peerage was conferred on him. He died unmarried Sept. 5, 1846. *Consult* Life, F. Thompson, 1937.

Metchnikov, ILYA (1845-1916). Russian-born French biologist. Born at Ivanovka, near Kharkov, May 15, 1845, he studied at Kharkov, Gessen, Gottingen, and Munich universities. In 1870 he was appointed to the chair of zoology and comparative anatomy at Odessa, and in 1882 went to Messina where he carried out bacteriological investigations. A Darwinist, he proved by experiment the existence of general laws of evolution applying to all animal organisms, and his biological research on comparative embryology led to his formulating the important theory of phagocytosis. In 1887 he joined the Pasteur institute in Paris, of which he later became assistant director, and gained a world-wide reputation by his discoveries. In 1884 he published a memoir on the intracellular digestion of invertebrates.



Ilya Metchnikov,
French biologist

Metchnikov achieved results of the highest importance in bringing bacteriology to the aid of therapeutics; he worked on a theory that man's life is unnaturally shortened by intestinal putrefaction, as a remedy for which he advocated the use of lactic ferments in the diet, especially sour milk. He also investigated many obscure diseases including cancer, and collaborated with Ehrlich in combating syphilis. He was awarded the Nobel prize for medicine in 1908. He died in Paris July 16, 1916. His chief works included *The Comparative Pathology of Inflammation*, 1892; *Immunity from Infectious Diseases*, 1901; *The Nature of Man*, 1903; and *The Prolongation of Life*, 1910. A Life by his wife appeared in English in 1922.

Metellus. Name of a plebeian family in ancient Rome, of which the most eminent members were the following. (1) Lucius Caecilius Metellus, consul 251 B.C., who inflicted a severe defeat on the Carthaginians in Sicily in the First Punic War. Subsequently he lost his eyesight in rescuing the Palladium (*q.v.*) from fire in the temple of Vesta. (2) Quintus Caecilius Metellus (d. 115 B.C.), grandson of the above, received the surname of Macedonicus in recognition of his successful campaign in Macedonia against the pretender Andriscus, whom he defeated and captured.

148 B.C. His other military successes were the defeat of the Achacans in 146, and his campaign against the Celtiberians in Spain. (3) Quintus Caccilius Metellus (d. c. 91 B.C.), nephew of (2), received the surname of Numidicus from having commanded the Roman army against Jugurtha (q.v.). Though successful he was recalled, his legate Marius having intrigued against him. Metellus afterwards became the leader of the aristocratic party at Rome, but owing to the machinations of Marius and Saturninus he was driven into exile. (4) Quintus Caccilius Metellus (d. c. 63 B.C.) was surnamed Pius from his efforts to secure the recall from banishment of his father, Metellus Numidicus. In the civil wars between Marius and Sulla he gained some successes, but in the war in Spain proved no match for Sertorius. (5) Quintus Caccilius Metellus Pius Scipio (d. 46 B.C.) was the son of Scipio Nasica, and adopted son of (4). He was one of the generals in command of the army of Pompey at the battle of Pharsalus in 48 B.C., and after the defeat at Thapsus in 46 committed suicide.

Metempsychosis (Gr., transference of the soul). Philosophical term for the transmigration or passage of the souls of men from one body to another after death. As nothing can be created out of nothing, and no substance can suffer annihilation, it is held by this doctrine that when the union of soul and body is dissolved, a new sphere of action is found for the soul in other bodies, of which it becomes in succession the animating principle.

A common phase of animism among savages in many parts of the world, it was developed philosophically by many of the ancient religions. It is a fundamental doctrine of the later Brahmanism, though not in the Vedas. It was held that by successive stages a man might sink into a beast as a punishment for crime, or rise to deity by a life of virtue. Buddhism, while denying the existence of the soul, changed the idea to a belief in the transmission of *karma*, or character formed by works, from one body to another. Thus the Jatakas describe the 550 previous births of Gautama Buddha, as a slave, elephant, frog, tree, etc.

The doctrine of metempsychosis, which is more or less allied to emanation and palingenesis, spread to Greece and was developed by Pythagoras and Plato. It affected the Hebrews, was taught in certain

early Christian sects, formed a tenet of Gnosticism, and was part of the faith of the Druids. Irenaeus uses the word *metensomatosis*. Simonides, in the 7th century, adapted the theory to a satire on women which is translated in Addison's *Spectator*, No. 209.

Meteor. Small fragment of cosmic matter, probably in general no larger than a grain of sand, travelling through interplanetary space. Should it penetrate into sufficiently dense layers of the earth's atmosphere, the air in front of the meteor is compressed, giving rise to incandescence. In general, the luminosity appears at heights between 100 and 50 m. above the ground. Although disappearance is most frequent at a height of 50 m., occasionally meteors are still visible at levels below 30 m. The luminous track of a large meteor may persist for half an hour or even longer, and can be studied by radar methods. These "shooting stars" travel through the atmosphere with velocities ranging between 500 and 4,000 m. per minute. The appearance of the larger meteors is sometimes followed by sounds, known as "detonations," probably due to the waves created by the passage of the meteor through the air. From a detailed consideration of the physical processes involved, Lindemann and Dobson showed, in 1922, that the observation of certain characteristics, such as the points of appearance and disappearance, velocity, and brightness, provide a means of estimating the density and therefore the temp. of the air at these great heights. The theory indicated that at about the 35 m. level, the atmosphere is warmer than that close to the ground—a result which in recent years has been confirmed by the more accurate measurements which utilise sound waves from explosions. Only during the 20th century has the term meteor been restricted to shooting stars; previously it was applied to any phenomenon occurring in the atmosphere.

Meteors move in regular orbits, and are regarded hypothetically as fragments which may be the relics of a larger body, but which are in any case dispersed in a huge swarm. Such a swarm may be only a few hundred miles thick, but its length, as is shown by the example of the Leonid meteors, may amount to hundreds of millions of miles. Schiaparelli has demonstrated that the unequal attraction of the sun for the individuals of a

swarm of meteorites moving round it would scatter them along the orbit, and in time produce a more or less complete ring; if this intersects the earth's orbit an annual meteor shower results.

The great display of Leonids on November 11–14, 1833, first drew serious scientific attention to meteors, though the shower had been known for at least a thousand years, being recorded in 902. It was shown that the radiation of the paths was only apparent, and the flights of all the shooting stars were consistent with the theory that they moved in parallel round the sun. The result of the investigations by astronomers was the prediction that a particularly brilliant display would appear about every 33 or 34 years, a result confirmed in 1867.

The shower which radiates from the constellation of Perseus on Aug. 9–11 has been observed since A.D. 830, and has been shown to have an orbit identical with that of Swift's comet of 1862. The history of the Andromedids, which come from Nov. 21 to 28, is as well known as that of the Leonids; the shower of 1872 proved that the swarm was moving along the same orbit as the last comet of Biela which divided in 1846, and has not been seen since 1852.

At present there is no generally accepted theory of meteors. Not every shower can be traced to a comet, nor does every comet give rise to a meteor-shower. Some eighty showers are known, and the following is a list of the chief of these, together with their approximate dates:

Quadrantids.	January 2–3.
Lyrids.	April 19–20
γ Aquarids.	May 1–6.
δ Aquarids.	July 28.
Perseids.	August 9–11.
Orionids.	October 21–23.
Leonids.	November 11–14.
Andromedids.	November 21–28.
Geminids.	December 10–12.

See Comet; Meteorite.

Meteor. Name given to a British jet-propelled fighter aeroplane. It was designed by W. G. Carter, and built by the Gloster Aircraft co. The Meteor was the only Allied jet-propelled aircraft to see operational service in the Second Great War, being especially successful against flying bombs. It set up world's speed records in 1945 (606 m.p.h.), and in 1946 (616 m.p.h.). The standard Meteor, fitted with two Rolls-Royce Derwent units each of 3,500 static thrust, and armed with four 20-mm. cannon, was capable of 595 m.p.h. at sea level, could climb to 40,000 ft. in

8 mins., and with extra tanks had a range of 820 m. The wing span, originally 43 ft., was later shortened to 37 ft. 2 ins. See Jet Propulsion.

Meteor Crater OR COON BUTTE. Basin-like depression in Arizona, U.S.A., 4,000 ft. in diam., 600 ft. deep, surrounded by a rim 150 ft. high above the surrounding plateau. Large masses of rock and fragments of meteoric iron surround the crater, which is considered to have been formed by the explosion of a large meteorite as it struck the earth's surface.

Meteoric Waters. Waters occurring in nature of atmospheric (meteoric) origin. They are most abundantly derived from rains, water courses, lakes, and oceans; they soak into the earth along fissures or pore-spaces in the crustal rocks. In part they are in the rocks and in part ascend to the surface again as springs, etc. During the course of their journey through rocks they may become charged with salts, of calcium, sodium, magnesium, potassium, iron, silicon, etc. These may be reprecipitated to form mineral deposits, *e.g.*, certain sulphur, magnesite, serpentine, and hematite ore-bodies. Processes of rock weathering are the result of meteoric water action.

Meteorite. Metallic or stony mass of matter reaching the earth from outside the earth's atmo-

interplanetary space as a fact. The two largest known were found in S.W. Africa and in Greenland. The first still lies at Grootfontein, and weighed 60 tons; the other, 36½ tons, was transported by Commander Peary to New York.

The fall of the great meteorite in central Siberia, on the watershed of the Khushmo and Kimohn rivers, on the morning of June 30, 1908, is without parallel in historic times. The flight followed a very sloping trajectory from S.S.W. to N.N.E. through not less than 300 m. of the atmosphere. In view of the great inertia of the meteorite (according to one investigator it weighed 130 tons), the resistance of the air reduced only slightly its cosmic velocity, estimated to be of the order of 50 m. per sec. On impact the explosion threw up incandescent matter to a height of more than 12 m., producing a vertical column of fire which was observed nearly 300 m. away. Near the point of fall the coniferous forest was uprooted and burnt by the hot explosive waves over a radius of between 5 and 10 m. Air waves felled and stripped trees of branches and bark for distances up to 30 m. around. In all about 3,000 sq. m. of forest were blown down. Sensitive barographs at places as far apart as London, Zagreb (Croatia), Batavia, and Washington recorded the air

waves from the explosion. A small earthquake was produced by the impact, oscillations through the ground being registered at several seismological stations, including Jena, 3,000 m. distant. During the two nights following, brilliant sky glows were seen over northern Europe.

A remarkable feature is that for nearly 20 years no expedition sought out the place of the fall of the giant meteorite; it thus escaped the notice of the scientific world until 1930.

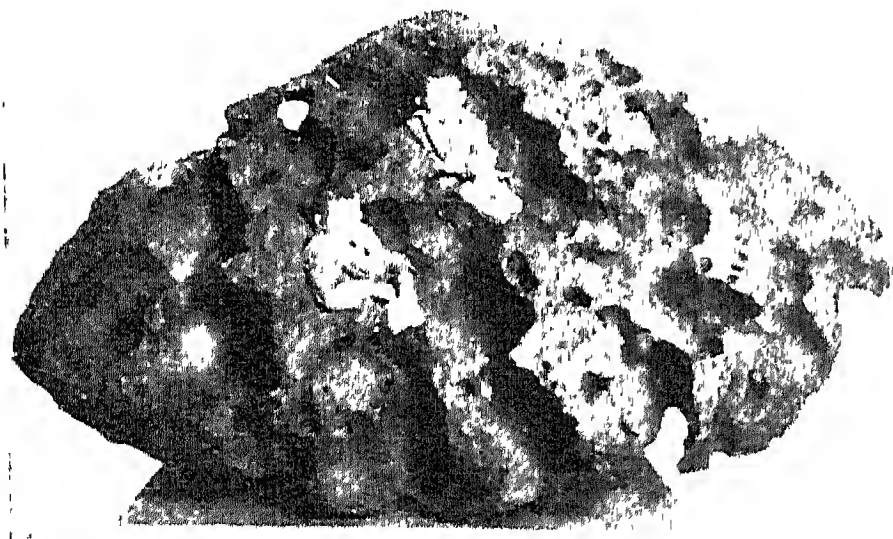
The large number of observed falls of meteors bears little relation to the enormous mass of meteoric matter which is reduced to vapour before it reaches the surface of the globe. A conservative estimate of the weight of the annual downfall puts it at not less than 360 tons.

Meteorites consist of iron or stone chiefly, though other elements, all of which are found on the earth, occur. From their helium content it is possible to deduce their age from the time they solidified. Ages of from 100 to 3,000 million years are thus found. It is surmised that they are fragments of larger bodies revolving round the sun, such as asteroids (*q.v.*). Occasional falls of very large meteorites have in relatively recent times produced craters over two miles across. The largest is the Chubb Crater in northern Quebec. See Meteor Crater.

Meteoritic Hypothesis. The theory suggested by Sir Norman Lockyer to account for the formation of planetary and other astronomical systems. The theory assumed that space was originally occupied by large swarms of meteors, collision between the meteors causing coalescence and giving rise to condensation of and accretion to masses of matter to form stars, etc. See The Meteoritic Hypothesis, Sir N. Lockyer, 1890.

Meteorograph. An instrument giving automatically a continuous record of atmospheric changes. A meteorograph devised by W. H. Dines for use in upper air investigations weighs only a few ounces and can be carried by comparatively small balloons, inflated with hydrogen, as high as the stratosphere. The registering elements are connected together to produce directly a graph of temp. related to pressure. The records are engraved on a silvered plate the size of a postage stamp and are read on descent by aid of a microscope. The use of meteorographs is becoming somewhat restricted owing to the development of radar. See Meteorology; Radio-sonde.

Meteorological Office. Name of the official meteorological service of the U.K. It was formed in 1854 as a department of the board of trade for the discussion of meteorological observations made at sea. In 1867 it was made a separate office, administered by a meteorological committee. Since 1919 it has been a department of the air ministry. It is responsible for meeting the meteorological requirements of the army, the R.A.F., civil aviation, other gov. depts., and the community in general, including groups, *i.e.* farmers, fishermen, to whom it is of first importance. It is responsible also for the organization of meteorological observations and observations of atmospheric electricity, terrestrial magnetism, and seismology



Meteorite. The Willamette meteorite, a mass of iron found in the Willamette Valley, Oregon, in 1902. It is 10 ft. long, 6 ft. 6 ins. high, and nearly 16 tons in weight. Courtesy of the American Museum of Natural History

sphere. Meteorites have been recorded from early times, *e.g.* by Livy, Plutarch, and Pliny. A meteor still preserved fell on Nov. 16, 1492, in Ensisheim in Alsace, weighing 260 lb. In 1794 Chladni gave scientific support to the idea that stones fell from outside the earth, but it was not until 1803 that a report by the French physicist Biot, on a fall of several thousand stones, compelled the scientific world to recognize the fall of stones on the earth from

in the U.K., for the collection and publication of meteorological information from all parts of the world, and for research in meteorological and geophysical subjects. Meteorological observations from a wide area, including ships at sea, are received almost continuously day and night at the Central Forecasting office by teleprinter and wireless. Weather charts are prepared and information on the weather situation, with forecasts and warnings, is issued at frequent intervals by teleprinter and wireless broadcasts. The office possesses a large library containing meteorological data from all parts of the world, which is available for public reference on application.

Meteorological Society, ROYAL. Society for the promotion of the science of meteorology. Founded in 1850 as the British Meteorological society, incorporated by royal charter in 1866, it

received its present title in 1883. In 1921 the Scottish Meteorological society, founded 1855, was amalgamated with the society. There is also a Canadian branch. Membership is composed of fellows (designated F.R.Met.S.), foreign members, associates, and student associates. Publications include the quarterly journal, *Weather*, the *Phenological Report*, and a bibliography of current meteorological literature; the monthly weather report of the Meteorological Office is available to certain classes of membership.

Among the awards of the society are the Symons memorial medal for distinguished work in connexion with meteorology and the Buchan prize for outstanding contributions to the society's publications. The society's offices are at 49, Cromwell Road, London, S.W.7; a meteorological station is maintained at 62, Camden Square, N.W.1.

second half. With the aid of his hygrometer, de Saussure showed that damp air is lighter than dry air at the same temp. and pressure; Dalton followed this by enunciating the laws of pressure of water vapour in the air. The aneroid barometer was invented by Vidie in 1847.

This development of instruments and the resulting observations gave rise to many important discoveries. In the age of the sailing ship the earliest endeavours to explain the circulation of the atmosphere were concentrated upon the causes of the trade-winds. These wind belts were first attributed purely to the distribution of solar radiation over the surface of the earth, but Hadley (in 1739) rightly took into account the effects of the earth's rotation on the enveloping layers of air.

Study of Storms

The mechanism of storms and the irregular weather changes of temperate latitudes were, however, only slowly understood. The origin and behaviour of cyclones received much attention in this period, to which also belongs the introduction of the synoptic chart as a means of treating meteorological problems; although such weather maps did not come into regular use for delineating and forecasting weather conditions until after the invention of the telegraph, the earliest indications of this method date from the work of Brandes and Redfield (c. 1820).

About 1845 Maury, of the U.S. navy, published wind and ocean current charts for the use of ship masters; these charts led to a reduction in the time of the passage from England to Australia from an average of 124 days to 97 days. The U.S. government were so impressed with such practical advantages of the collection of weather observations that they called an international conference which was held at Brussels in 1853. The study by the French astronomer, Leverrier, at the instigation of Napoleon III, of the severe gale which traversed the Mediterranean in 1854 and subsequently caused much damage to the allied fleets in the Black Sea during the Crimean War, has become a classic. Leverrier collected sufficient material to make it possible to plot a series of primitive weather maps. He then found that the storm had moved along a regular path with a fairly uniform speed, and consequently suggested that if arrangements were made for the

METEOROLOGY: WEATHER SCIENCE

A. J. Drummond, F.R.Met.S

An account of the origins and changing methods used both for the observation of actual weather conditions and for the forecasting of future conditions. See cognate articles on e.g. Lightning; Rainfall; Temperature; Weather

Meteorology (Gr. *meteōros*, lofty; *logos*, discourse), the science of the earth's atmosphere, is concerned primarily with the processes manifested as weather and seeks to give physical explanations of them. In its fullest sense, however, the subject embraces, in addition to the physics of weather and climate, the study of atmospheric optical and electrical phenomena and, more remotely, certain aspects of terrestrial magnetism.

From the earliest recorded times the changes taking place in the state of the atmosphere occupied man's attention and in consequence there arose the weather rules to be found in folklore. Many of these sayings can be traced back to the writings of Aristotle's pupil, Theophrastus, in the 4th century B.C. The appearance of Aristotle's *Meteorologica*, from which the name meteorology is derived, represents a great landmark in human knowledge as it is the first systematic discussion of the atmosphere and its phenomena. The Greeks made meteorological observations, especially of the winds because of their practical use in navigation. The measurement of rainfall, one of the oldest of meteorological measurements, was undertaken in India as early as 400 B.C.

The beginning of a new era in meteorology is marked by the inventions of the thermometer by Galileo in 1607, and the mercurial barometer by Torricelli in 1643. A few years after the latter event, observations on the Puy-de-Dôme showed that the barometric pressure decreases with height, and it was not long before the study of the atmosphere came to be regarded as a physical problem to be approached by the coordination of observations such as those outlined in the scheme for making a record of the weather which Hooke communicated to the Royal Society about 1670. The discovery of Boyle's law, 1662, governing the relation between the volume and the pressure of a gas, was the first step towards the understanding of the dynamics of the atmosphere. In 1700 Dampier compiled his celebrated *Discourse of Winds* in which he described with remarkable fidelity the main characteristics of the trade winds; some few years previously he recognized that typhoons were revolving storms. The Fahrenheit and Centigrade scales of temperature were introduced in the first half of the 18th century and the hair hygrometer of de Saussure and the anemometer of Woltman in the

collection, by telegraph, at a central office of weather reports from suitable observing stations, analysis of charts based upon these reports would allow the future path of the storm to be extrapolated and due warning to be given of its approach. A number of meteorological stations were established, and in the middle years of the 19th century there grew up in most countries organizations for the collection and discussion of meteorological information.

In 1858 the French government established a telegraphic weather service with its headquarters in Paris. A corresponding service was brought into operation in Great Britain two years later. The first daily weather report to be published originated in Great Britain, in 1851. A conference of leading meteorologists, representative of many countries, was held at Leipzig in 1872—the forerunner of the regular meetings of the present-day International Meteorological Organization. The I.M.O. initiates any necessary measures for the development or improvement of international meteorology; and upon its activities depends the ability of each country to obtain promptly and accurately from other countries the reports which form the nucleus of the synoptic charts, and on which weather forecasts are based.

Meteorological Systems

The state of the weather at a given time and place is generally specified by the values possessed by the meteorological elements, namely, air temp., humidity, pressure, wind, precipitation (rain, snow, etc.), and clouds. The standard practice of representing the weather conditions over any region consists of bringing together observations made simultaneously at a network of stations by plotting them on a map, thus affording a bird's eye view, so to speak, of the geographical distribution of the various prevailing elements.

The period following the introduction of the synoptic chart saw the recognition of definite meteorological systems, such as depressions or “lows” and anticyclones or “highs,” which retain their identity perhaps for days at a time and often travel long distances carrying their characteristic distribution of wind and weather with them. In 1860 Buys-Ballot discovered his famous law which states the connexion between the wind and the pressure distribution. Seven years later

Buchan published the first charts of monthly isobars, showing how the pressure over Europe diminishes gradually from S. to N. all the year round, with permanent low pressure near Iceland, and demonstrating the effect of pressure gradient upon wind velocity. Despite the multiplication of observations, however, the chief methods of forecasting which developed were statistical and derived from past experience. Little consideration was given to physical explanations, and few attempts were made to use physical principles, *e.g.* those that govern motion and the relation between heat and motion.

Solar Radiation

The earth's atmosphere has been compared to a gigantic heat engine. Solar radiation passes through the atmosphere without much appreciable interference unless a cloud lies in the path of the rays, in which case they would be reflected back towards space. Radiation reaching the surface of the earth, warms it and, in turn, the layer of air close to the ground. The principle heat sources of the atmospheric engine are, therefore, to be found in the tropics and middle latitudes—over the continents in summer and over the warmer sea currents in winter. Now the energy which is retransmitted by the surface of the earth is of a much longer wavelength and cannot easily penetrate the water vapour always present in the atmosphere. In any layer the water vapour will absorb radiation coming up from the earth on the one hand, and from adjacent higher and lower layers, on the other, the intensity of the radiations depending, of course, upon the temps. of the emitting sources. At a certain height a layer would be reached where the loss of heat is greater than the gain, and it is there that the main cold source is to be located. In the cold regions the air will sink and in the heated ones it will rise; between the two regions there will be movement of air horizontally. As the atmosphere as a whole gets neither hotter nor colder, there is a balance between the heat gained and that lost. Also, it is only recently that the part played by water, in the form of clouds, in regulating the temp. at the surface has been appreciated.

At present little is known concerning the vertical distribution of water vapour in the atmosphere. When the complexity of the radiation problem is also

considered, the difficulties the meteorologist faces in attempting to locate the heat and cold sources of the air and improve his understanding of the dependent wind systems are at once apparent. The agents responsible for the exchange of cold polar air masses with the warm tropical air masses are the depressions and the anticyclones, which may be envisaged as huge turbulent eddies, or vortices with vertical axes, developed in westerly and easterly air streams. Since the middle of the 19th century it has been realized that two currents of air, differing markedly in temp. and velocity, may flow adjacently and, as one succeeds the other, produce, at a given place, distinctive sets of weather phenomena. The moving discontinuities, or boundary lines, can extend over hundreds of miles and frequently are conspicuous on a synoptic chart. Norwegian meteorologists first examined the currents scientifically in detail. It was found that normally the currents could be followed from day to day; they differed from each other in direction, speed, temp., etc., and when they met abruptly, *e.g.* when warm air is pushed up over cold air, certain weather characteristics the discontinuities. It is not, therefore, the depressions and anticyclones as such that are important in determining the weather, but rather the interactions between the various air masses involved in the wind systems. The boundary between two air masses is referred to as a frontal surface and the intersection of this surface with the ground as a front. According to this theory, depressions form initially as small waves on a frontal surface, later growing into roughly symmetrical vortices.

The Upper Air

Up to the last decade of the 19th century systematic meteorological observations were confined almost solely to those made at ground level. Real knowledge of the temp. of the free air dates only from 1898, when de Bort introduced his sounding balloons carrying self-registering instruments to heights which up to that time had never been attained, and about which no information was then available. The following year de Bort made the discovery that the upward decrease of temp. (1° F. per 300 ft. approx.) ceased at a certain height; above this level the temp. was either uniform or even

increased slightly. This epoch-making revelation of the stratosphere, as the upper layer was later termed, attracted great attention to his measurements. Similar methods were adopted in other countries and an intense investigation of the upper air was inaugurated. In the new era thus opened, W. H. Dines, chiefly by his design of an extremely light and robust meteorograph, played a leading rôle in bringing Great Britain to the forefront of this work. Exploration was not restricted to organized meteorological services, and soundings were made over the oceans and tropical Africa. Moreover, most polar explorers and expeditions included this aspect among their scientific activities.

Charting the Stratosphere

Direct measurements made on aircraft of temp. and humidity at regular intervals of height have provided yet another means of systematic observation, and during the Second Great War Spitfires carrying out meteorological flights attained heights of some 8 m., compared with 5 m. or so of the period between the two wars. A radio technique, aimed at securing additional information about the upper atmosphere, was later adopted almost to the exclusion of all others. The radio-sonde, carried upwards by a balloon, automatically transmits, by radio, signals representative of the meteorological elements, temp., pressure, and humidity, to receiving stations on the ground. Continuous soundings to levels of 10 m. or 12 m. are frequently obtained and in the British meteorological service the upper air programme provides for radio-sonde ascents from a number of selected stations four times daily. Radar methods are also used to determine the position of the balloon carrying the transmitter, at any instant, and so give an indication of its path, from which the direction and speed of the upper winds can be deduced. With this technique it is unnecessary to await the recovery of the instrument on descent. A feature of current synoptic analysis is the construction of series of charts for the upper levels of the atmosphere; in Great Britain the practice is to draw isopleths showing the height of the surface of chosen values of pressure, *e.g.* 700 mb., 500 mb., etc. Thus a three-dimensional representation is obtained of the structure of the atmosphere and of the air mass movements which are taking place.

Research has shown that the tropopause—the sharp surface separating the stratosphere from the underlying region, or troposphere—over England is generally at a height of about 7 m., although occasionally it may be as high as 10 m. and as low as 4½ m. On the average, the base of the stratosphere occurs at a higher level in the tropics (10 m.) than at the poles (6 m.); and as the temp. is lower the greater the altitude at which the transition from troposphere to stratosphere takes place, the coldest-known terrestrial region is 10 m. above the equator, where a temp. of -130° F. has been registered. At the ground the lowest temp. on record is -95° F. (Siberia). During the Second Great War it was observed that the conspicuous condensation, or vapour, trails produced in the exhaust of a high-flying aircraft disappeared when the aircraft climbed into the stratosphere. Investigation with a specially designed hygrometer revealed that the air of the stratosphere is invariably extremely dry. Since the presence of even minute proportions of water vapour exerts an influence on temp., this discovery is of the greatest importance. It has been suggested that the source of this dry air is the cold and therefore dry equatorial stratosphere, which would indicate a world-wide circulation of air in these upper regions of the atmosphere. It is not known precisely how far the stratosphere extends upwards, but it appears from the study of the travel of sound waves in the atmosphere, by Whipple and others, that at a height of between 22 m. and 25 m. above sea level the temp. begins to increase again at about the same rate as it decreases in the troposphere; how far the rise continues is not yet certain. Temps. in this upper warm region exceed those found on the ground at the equator, and at a height of 40 m. would seem to be of the order of the boiling point of water.

Study of the Troposphere

In the troposphere the general surface temp. is determined chiefly by radiation, and the temp. gradient in the air by turbulence. It is in this region that the formation of cloud and rain takes place. The rate at which temp. there falls off vertically, usually referred to as the lapse rate, is far from being regular; not infrequently the decrease is interrupted by layers, several hundreds or even thousands of feet thick, in which the temp. remains constant, or even

increases with altitude. Such layers are termed inversions and are associated with stable conditions in the atmosphere. The lapse cannot exceed the adiabatic lapse rate (5° F. per 1,000 ft.), *i.e.* the rate at which the temp. of a mass of dry air alters when subjected to change of level in consequence of the work done by or upon it in expanding or contracting. Any temporary increase of lapse rate beyond the adiabatic limit (*e.g.* by the heating of the surface layers faster than those higher up) indicates conditions of great instability, which give rise to powerful convection currents and the development of thunderstorms.

New Methods and Instruments

During the Second Great War the meteorologist was provided with many ingenious new instruments and techniques, a number depending upon the close association between meteorology and radio. By observing, at a wide network of sites, the bearings of atmospherics due to lightning flashes distant thunderstorms can now be detected and their movements plotted. Thunderstorms are, however, frequently associated with the cold fronts of depressions; such "static" reports will obviously form valuable supplements to the information at the disposal of the synoptic analyst. At closer ranges, the application of microwave radar principles fulfils several purposes. Wind finding balloons can be tracked with a high degree of accuracy. Cloud types can be identified and warning received of the approach of rainstorms. As the nature of the echo from a collection of water drops depends to a great extent upon the size of the drops, it is possible with a radar beam to investigate the distribution of drop size and concentration of drops in a cloud. Again, the refraction of radio waves by the atmosphere affords a means of studying the humidity gradient upon which the refractive index of the air, at radio frequencies, largely depends.

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METEOROLOGICAL STATIONS. Places where regular observations

of weather are made and recorded. When reports are made to a central office the observations are on a uniform plan according to a set time-table. Stations can be classified according to the character of the observations made. At the most important observatories continuous records are kept of pressure, temp., wind, rainfall, and sunshine, and frequent observation is made of cloud and other elements. A normal climatological station records pressure, temp., wind, cloud, and weather at two or more fixed hours each day, together with the daily rainfall. At auxiliary climatological stations the observations are less complete, being taken only once each day or other than at the recognized times. Telegraphic reporting stations make more detailed observations at 3-hourly intervals for use in the preparation of the synoptic charts for weather forecasting; at airfields observations are made each hour. Agricultural-meteorological stations devote special attention to earth temps. and health-resort stations make observations chiefly for publicity purposes. The bulk, however, of the 5,500 meteorological stations in the British Isles record only rainfall.

The Meteorological Office (*q.v.*) maintains observatories at Kew (Surrey), Eskdalemuir (Dumfries), Aberdeen, and Lerwick (Shetland), and also receives reports from the Royal Observatory, and the observatories at Liverpool, Southport, and Paisley. In addition it receives daily reports from the minor stations. See Weather.

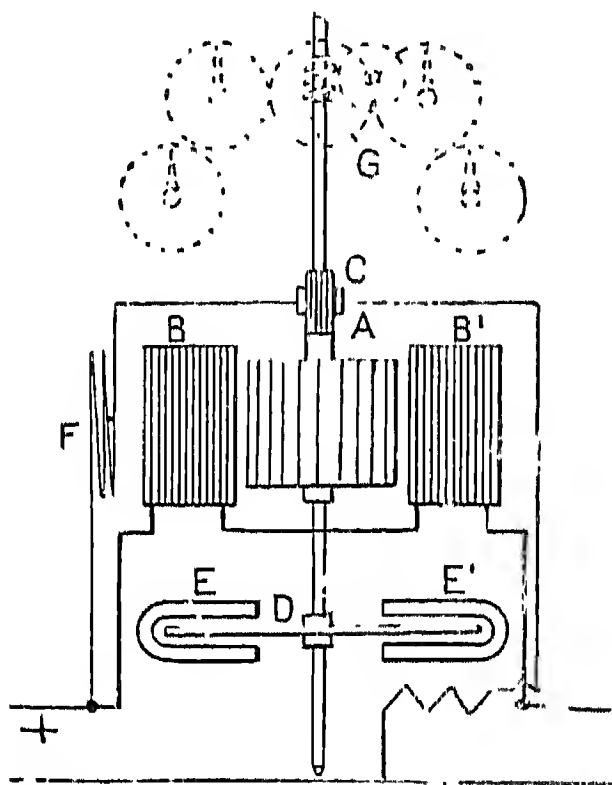
Meter. Instrument for measuring quantities of electric current, gas, water.

ELECTRIC METERS. These can be divided into three general classes: indicating; recording; integrating. Indicating meters, or indicating instruments, show the value in terms of some known unit of power of the quantity being measured at any particular moment by means of a pointer moving over a graduated scale. To this class belong the galvanometer, the voltmeter, and the ammeter (or amperemeter), the power factor indicator, which measures the difference in phase between current and voltage in an A.C. circuit, and the wattmeter which has both current and voltage coils and measures the power in a circuit by multiplying the current by the voltage (by the power factor in an A.C. circuit). The ohmmeter, by dividing volts by amps, gives direct indication of the electrical resistance of a circuit.

Recorders are indicating instruments with the pointer and scale replaced by an inked stylus or pen resting on a chart driven by clock-work so that it traces out a continuous record of the value of the quantity over a period of time.

Integrators, or energy meters, measure the total energy passed in a given time, directly in kWh. or B.o.T., units by integrating power and time, irrespective of how the power varies over the period. Integrators are of three main classes, chemical, clock, and motor.

In most energy meters a small motor (either A.C. or D.C. according to the supply), whose torque is proportional to the power in the circuit, drives an eddy current brake. This consists of an aluminium or copper disk rotating between the poles of a powerful permanent magnet, thus setting up



Meter. Fig. 1. Diagram of meter for recording electricity consumption. For explanation see text

eddy currents in the disk, and giving a braking torque which is proportional to the speed but is without friction. The speed of the motor with such a brake is directly proportional to the power in the circuit, so that the actual number of revolutions made is a measure of the energy passed, and this is ascertained by a simple counting train of gearwheels and dials which can be calibrated directly in kWh.

Fig. 1 is an elementary diagram illustrating the principles of operation in a D.C. meter. A is the armature connected as a voltage coil through the commutator C. B B' are the field magnets, connected as current coils. D is the eddy current brake disk, and E E' the brake magnets. F is a small auxiliary field coil to compensate for friction at light loads, and G is the gear train for counting the revolutions.

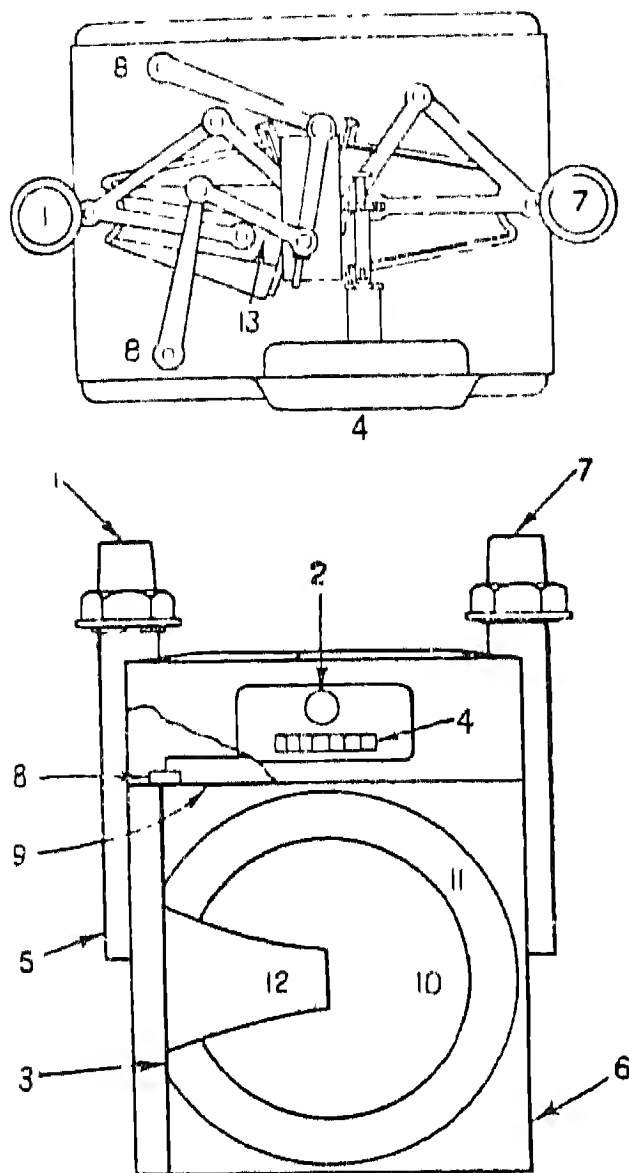
Alternating current meters are simpler in construction but more complex in action. The rotating element consists of a single disk in which both driving and braking torques are induced simultaneously, one half of the disk acting as a small induction motor under the action of current and voltage coils, and the other acting as an eddy current brake.

The prepayment meter, frequently used in residential premises, consists of a standard meter unit with an extra gear train connected to a spring-operated switch, which is closed by a loose handle or knob outside the meter. This knob can be temporarily connected to the mechanism by the insertion of a coin, which falls through into a collecting box after the knob has been rotated, and the switch closed. The action of closing the switch also sets up the gearing by a certain amount. The rotation of the meter element gradually unwinds the gearing, and opens the switch after a certain number of revolutions, unless the mechanism has been further set-up by the insertion of another coin. (See Ammeter; Galvanometer; Ohm's Law; Voltmeter.)

GAS METERS. These include positive displacement and inferential types. For use on consumers' premises a meter must satisfy requirements of Gas Works Clauses Act and Sale of Gas Act, under which it is a statutory obligation to supply gas by meter. Meters in use, which must be accurate within the limits 2 p.c. fast (in favour of supplier) and 3 p.c. slow (in favour of the consumer), are of the dry or bellows type, to the Institution of Gas Engineers specification, and fitted in accordance with B.S. Code of Practice for installation of gas meters.

The dry meter (see Fig. 2) consists essentially of a sheet-iron or steel box, 6, divided horizontally by a valve plate, 9, into two main chambers, the upper of which is termed the attic, the lower the body. The body is divided into two compartments by the diaphragm plate, attached to either side of which are the diaphragms of sheepskin, 11. The diaphragms are supported conically by attachment to diaphragm disks, 10, which are in turn supported by hinges, 12, known as flags. Lateral movement of the diaphragms is caused by their inflation and deflation by the gas in its passage through the meter. This lateral motion is communicated by the flags which are attached to flag rods, 3 mounted

vertically, and which, by means of tangential gearing in the attic, convert it into rotary motion to



Meter. Fig. 2. Diagrammatic vertical cross-section of dry gas meter showing one bellows. A similar bellows is mounted on the back. Upper diagram is a plan of the attic showing the valves, 13, and gearing mechanism

actuate the recording index and, in addition, work the valves which open and close the admission and outlet ports to the measuring chambers. Gas enters at inlet 1, and leaves at outlet 7. The flag rods pass through gas-tight stuffing boxes 8. The large dial 2 is for testing and the smaller dials or figures record the gas consumption. The direct reading index 4 is superseding the dial type.

WATER METERS. These are used to record the quantity of water passing into premises through a supply line; or to register the flow at any particular point in a distribution system. For large flows, a Venturi type of mechanism is used. The water passing through is measured (1) by a pair of pistons working in cylinders of known capacity, into each of which the water enters in turn; the piston movement is transmitted to a graduated dial; (2) by a moving gate or flap in the waterway, connected by linkage to an indicator recording on a chart affixed to a rotating drum; the greater the rate of flow, the wider the gate opens; (3) by the principle of the Venturimeter (*q.v.*): water flowing through the narrowed throat of the tube loses head but gains

velocity; after leaving the Venturi throat it loses velocity but regains head. Thus there is a pressure difference between the upstream side of the tube and the throat equal to the difference of head. Pressure pipes leading from the upstream side of the tube and from the Venturi throat are taken to float chambers, in which floats rise and fall with the columns of water therein and communicate information to the recording apparatus. The latter comprises a rotating drum where time intervals and the rate of flow are registered. Integrating mechanism records the total flow on counter dials.

Metford, WILLIAM ELLIS (1824-99). British inventor. Born at Taunton, Oct. 4, 1824, and educated at Sherborne, he was apprenticed to Isambard Brunel and became a railway engineer. In 1856 he went to India in the service of the E. India rly., and saw fighting in the Mutiny. He invented an expanding bullet in 1863 and a rifle for it in 1865, but the bullet was condemned by the St. Petersburg convention of 1869. In 1871 he produced a breech-loader which won the Wimbledon prize. In 1888 his improvements and inventions were incorporated with those of S. P. Lee in the Lee-Metford rifle adopted by the British army. He died at Bristol, Oct. 14, 1890.

Methane. Colourless, odourless gas. Found in the free state in nature, its chemical formula is CH_4 . In its pure form it burns with a pale, non-luminous flame. It is the lowest of the paraffin series of hydrocarbons and is the only one with but a single atom of carbon in the molecule. Also known as marsh gas, firedamp, and methyl hydride, it is given off by decaying vegetable matter in stagnant pools and marshes, and, when ignited, forms the will-o'-the-wisp. Large quantities of firedamp (*q.v.*) are formed in coal measures by the slow decomposition of the coal.

Methane is a constituent of coal gas. Prepared by heating equal parts of dried sodium acetate and soda-lime in a copper flask, and collecting the gas over water, it generally contains hydrogen and ethylene as impurities. To prepare chemically pure methane, methyl iodide is dropped slowly into a flask containing a copper-zinc couple covered with dilute alcohol. The flask is gently heated, and methane is evolved. See Hydrocarbon.

Methil. Seaport of Fifeshire, Scotland, forming part of the police burgh of Buckhaven and Methil (*q.v.*). On the N. shore of the Firth of Forth, 1 m. S.W. of Leven by rly., Methil has a tidal harbour, with three docks, and exports coal.

METHODISM: HISTORY AND TEACHING

Rev. Leslie F. Church, Ph.D., Editor, Methodist Magazine

This article deals with a religious movement that originated in 18th century England and became one of the great world-wide branches or denominations of the Protestant faith

Methodism was originally a term of ridicule applied to religious extremists, but has now been accepted as an honourable description of an important branch of the Christian Church. Methodism was largely responsible for the evangelical revival of religion in 18th century England. In 1729 a small group of Oxford students banded themselves together to study the Bible regularly, to visit prisoners in the Bocardo, the Oxford jail, to care for the poor, and to observe the ordinances of the Church, especially Holy Communion. They were called Bible Moths, the Holy Club, and, because they had agreed to "live by rule," Methodists. The movement was a virile spiritual reaction against the selfish and artificial life of the time. Religion particularly in the form of cold deism, had lost touch with the people. The masses were discontented, hungry, and inarticulate; English political and philosophical

leaders were for the most part ignorant of their existence or indifferent to their needs. Perhaps the influence of Methodism saved England from the excesses of the French Revolution, not by administering an opiate but by quickening the despairing multitudes to new hope and self-respect.

In 1735 John and Charles Wesley went to Georgia with the idea of helping General Oglethorpe in his colonial administration, and of "converting the Indians." They were unsuccessful, and returned deeply concerned about their failure. Three years later, after being influenced by the Moravians, the two brothers experienced a spiritual transformation. They were converted. From cold, scholarly churchmen, they became warm-hearted powerful evangelists. Religious societies, not unlike the little Oxford fellowship, were founded all over the land. Methodism grew with

amazing rapidity. Itinerant preachers, directed by John Wesley, the greatest of them all, ranged the country. Religious apathy was ended by the creation of fellowships (band-meetings and class-meetings) formed by men and women who had a new and intimate sense of the presence of God in their lives.

In 1739 the first preaching-house was built at Bristol. In London Wesley bought the Foundry, an old cannon factory, which he adapted as a chapel. In 1741 Thomas Maxfield was allowed to function as a lay-preacher, and so began what has become one of the most important features of Methodism. Local preachers, as they are now called, today number in the British Isles alone, 27,560.

In 1741 Wesley and his followers declared themselves opposed to the Calvinistic doctrine of "election," maintaining the Arminian doctrine of "free grace for all." This led to a break with George Whitefield, who had long been associated with the Wesleys.

The Conference

The first Conference, consisting of six clergymen and four lay-preachers, met in 1744, in London. Conferences have been held each year since, and the Conference has become a vital part of the constitution of the Methodist Church. "It is," says Dr. Fitchett, "a parliament with all the functions of legislation, a cabinet of administration, a court of discipline, and the machinery by which the system of an itinerant ministry is regulated." It is a representative body, democratically elected, and consisting at present of 650 members, 325 of whom are ministers and 325 laymen. Each year a president and vice-president are elected by the members. It has a ministerial session of 450 ministers.

The Methodist societies, consisting of the members of the local classes, are grouped in circuits geographically; the circuits are combined in districts, each similar to a diocese. Superintendent ministers have charge of circuits, and chairmen administer the districts. The individual member is related to Conference through his class, the local leaders' meeting, the circuit quarterly meeting, and the district synod.

Methodism has retained the general organization of the primitive Christian Church. Its constitution is presbyterian rather than episcopal, but its stewards correspond to the "deacons," its

local preachers and exhorters to the "prophets," and its class-leaders to the "teachers" of sub-apostolic times.

In 1747 Methodism spread to Ireland and in 1751 to Scotland. In 1784 Wesley, as a presbyter of the Church of England, claimed the right to ordain Dr. Thomas Coke and Francis Asbury as "superintendents" for the work in N. America. They were subsequently termed "bishops" in the Church, which became known as the Episcopal Methodist Church of U.S.A. Though the Wesleys remained nominally in the Church of England, many pulpits were closed to them. This led to the field-preaching which was, in its early years, the most important side of their evangelistic efforts. By 1784 there were 359 Methodist preaching-houses in England. Today the number of churches under the jurisdiction of the English Conference is 16,459.

If John Wesley by his preaching and statesmanship became the preacher of the Methodist Church, Charles Wesley with an inimitable tenderness sang the theology of the evangelical revival into the hearts and minds of the people. His hymns have had an abiding influence throughout Christendom, and have conveyed the message of "free salvation" more intimately than the words of the preachers.

It was obvious at the death of John Wesley that the Methodists would separate from the Church of England, and indeed he himself had prepared for the event. It has since been felt that a wiser handling of the situation by the contemporary Anglican leaders might have prevented the division. In 1795 a "plan of pacification" established for Methodists the right to administer the sacraments and to hold their services during the statutory hours for public worship.

Characteristics of Methodism

Methodism, from the beginning, revealed a genius for social and educational reforms. Its early preachers carried cheap but wholesome literature in their saddle-bags, and encouraged the illiterate to read. Some of the strongest opponents of the slave-trade were amongst the Methodists, and in later years they showed enterprise in new forms of home mission work, and in widespread missionary activities overseas. Methodism has always claimed as its motto John Wesley's famous words: "The world is my parish." At the end of the 19th century there began the forward movement which was

designed for the evangelisation of London and the larger towns. A sum of a million guineas was raised by 700,000 Methodist contributors to carry on this work, and to build great central halls to serve as headquarters for religious and social activities.

In 1796 Alexander Kilham founded the Methodist New Connexion. He had criticised the constitution of Wesleyan Methodism as not being sufficiently democratic, and maintained the right of all Methodist preachers to administer the sacraments. In 1815 the Bible Christians, or Bryanites, established themselves as another branch of Methodism; so did in 1827 the Protestant Methodists, in 1835 the Wesleyan Methodist Association, and in 1849 the Wesleyan Reformers. Subsequent fusions brought these smaller bodies together, until in 1907 they were all united as the United Methodist Church.

In 1810 Hugh Bourne and William Clowes founded a society known first as Camp Meeting Methodists, but in 1812 as Primitive Methodists. This and the other sections which had sprung from Wesleyan Methodism differed little in theological outlook. The divisions were caused largely by disagreement on points of administration and procedure.

Reunion of all Branches

After long negotiations the Wesleyan Methodists, the Primitive Methodists, and the United Methodists decided to effect a complete union. The Methodist Church Union Act was passed in 1929, and in 1932, by the deed of union, the amalgamation was completed. Though this meant some adjustment in the constitution of each of the three Churches, it maintained the doctrinal standards to which all three had subscribed.

In order to secure uniformity in administering Trusts there is a model deed on which the greater part of Methodist properties are now held.

In Canada all the Methodist sections united to form the Canadian Methodist Church in 1883, and in 1925 this Church joined with the majority of Presbyterians and Congregationalists to form the United Church of Canada.

In Australia, New Zealand, and South Africa there are flourishing Methodist churches with their own conferences and without any sectional distinctions.

Methodism came to America first through Capt. Thomas Webb,

an English officer, Philip Embury, and Barbara Heck, settlers from Ireland who had been exiled from the Palatinate. The first Methodist conference in America was held at Philadelphia in 1773. Today it is estimated that there are 16,049,841 members of Methodist churches in the U.S.A. The approximate world figure of membership is 19,300,000, but the number of adherents is estimated at over 30,000,000.

The doctrinal standards of Methodism are still Wesley's four volumes of sermons, and his Notes on the New Testament. Recently new editions with explanatory notes have been prepared. The doctrines specially stressed are Assurance, Conversion, and Holiness or Christian Perfection. Fundamentally the Methodists hold theological beliefs similar to those accepted by the evangelical section of the Church of England.

The training of candidates for the Methodist ministry has been steadily progressive. At present there are in England six theological colleges: Hartley (Manchester), Didsbury (Bristol), Richmond (London), Headingley (Leeds), Handsworth (Birmingham), and Wesley House (Cambridge). There is also a Methodist theological college at Edgehill, Belfast. Most of these are affiliated to the neighbouring university, and their staffs are recognized.

Basis of Membership

The basis of membership in the Methodist Church is laid down in the Standing Orders. Members must "sincerely desire to be saved from their sins through faith in the Lord Jesus Christ, and evidence the same in life and conduct," seeking "to have fellowship with Christ Himself and His people by taking up the duties and privileges of the Methodist Church." Their names are enrolled on class-books, and each person is under the pastoral care of a class-leader. They are expected to have received Christian baptism either as infants or adults before they are received into full membership of the Church.

Recently the Methodist Church in Great Britain and Ireland has appointed commissions to report on Methodism in rural areas, and on the state of the Church generally. The activities of its youth, its newly-developed women's fellowship, and other signs, point to a revival of the spiritual enterprise of its earlier years.

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Methuen, PAUL SANFORD METHUEN, 3RD BARON (1845-1932). British soldier. Born Sept. 1, 1845, he was educated at Eton, and in 1864 was commissioned in the Scots Guards. He served in Ashanti, 1874, and the Egyptian War, 1882; commanded Methuen's Horse in Bechuanaland, 1884-85; and was a divisional commander in the S. African War, 1899-1902. Sent to relieve Kimberley, he was defeated at Magersfontein, Dec. 12, 1899. In March, 1902, he was taken prisoner at Twycross. He was c.-in-c. in S. Africa, 1907-09, governor of Natal, 1909, and governor of Malta, 1915-19. In 1911 he was made a field-marshal, and in 1920 became constable of the Tower of London. He died October 30, 1932. His son, Paul Ayshford Methuen, who succeeded as 4th Baron, was born Sept. 29, 1886, and educated at Eton and New College, Oxford. A distinguished painter and pupil of Sickert, he had several one-man exhibitions. He was a trustee of the National Gallery, and of the Tate Gallery, 1938-45.

Methuen Treaty. Treaty concluded Dec. 27, 1703, with Portugal by Sir Paul Methuen, acting on behalf of Great Britain. Its effect was to bring Portugal into the war of the Spanish Succession as a member of the Grand Alliance (*q.v.*). Portugal was to provide 28,000 troops, Britain agreeing to pay for the maintenance of half of them. The treaty also gave advantage to Portuguese wine in the English market, and corresponding advantage to English wool in the Portuguese markets. From the Methuen Treaty dates the popularity of port wine in England.

Methuselah. Son of Enoch and grandfather of Noah (Gen. 5). He is stated in the O.T. to have lived 969 years, the greatest age recorded among the patriarchs, but the

Samaritan text gives it as only 720 years. These figures are considered to be merely traditional.

Methven. Parish and village of Perthshire, Scotland. It is 8 m. by rly. W. of Perth. The churchyard contains the tomb of Lord Lynedoch, the General Graham of the Peninsular War. In the battle of Methven, 1306, the English were successful over Bruce. Methven Castle dates partly from 1680. Pop. 1,700.

Methyl. Name given to the group of elements represented by the formula CH_3 . It is not known in the free state, but its derivatives are very numerous. The name was originally applied to ethane (C_2H_6) until the true constitution of the molecule was recognized. See Carbonates.

Methyl Alcohol. Colourless liquid with an odour like that of ordinary alcohol (ethyl alcohol). On ignition it burns with a blue flame, and, like ethyl alcohol, it possesses great solvent powers. In the crude state it is known as wood naphtha or wood spirit, because until recently it was prepared on a large scale by the dry distillation of wood. It is freed from acetic acid, acetone, and other bodies produced at the same time by rectifying in stills similar to those employed in purifying alcohol. Methyl alcohol is also produced as a by-product in the beet-sugar industry. Synthetic methyl alcohol is now made on a large scale from water gas by a catalytic process.

Commercial wood spirit contains from 75 to 90 p.c. of methyl alcohol. This spirit is used as a solvent for making varnishes and french polish, and as a denaturant of methylated spirit. The commercial spirit is purified by distilling with lime and fractional distillation, and chemically pure methyl alcohol may be made from commercial spirit by mixing it with calcium chloride, and heating. When the compound thus formed is heated pure methyl alcohol is obtained. The purified wood spirit is largely used in the manufacture of aniline dyes.

Methylamine. Colourless gas with a fish-like odour. It was discovered in 1849 by Wurtz, who prepared it by acting upon methyl isocyanate with caustic potash. It is contained in bone oil, crude wood spirit, and herring brine. Dimethylamine and trimethylamine are also known. These are liquids with a characteristic fishy odour.

Methylaniline. Alkyl derivative of aniline. It is manufactured by heating aniline with methyl

alcohol and hydrochloric acid, and is a colourless liquid. It is extensively employed in the dyeing industry and as the raw material for explosives.

Methylated Spirit. Alcohol which has been rendered unfit for use as a beverage by denaturising. The object of the process is to allow the sale of alcohol for manufacturing purposes free of the heavy duty charged on alcohol. There are four kinds of methylated spirit: (1) mineralised methylated spirit, consisting of alcohol mixed with one-ninth of its bulk of wood naphtha, $\frac{1}{2}$ p.c. of crude pyridine, three-eighths of 1 p.c. of petroleum, and a trace of aniline dye; (2) industrial methylated spirit, containing only one-nineteenth of its bulk of wood naphtha; (3) pyridinised industrial methylated spirit, which is the same as (2) but with $\frac{1}{2}$ p.c. of crude pyridine; and (4) power methylated spirit, consisting of alcohol to which have been added small quantities of petrol, pyridine, wood naphtha, and dyes. Retailers of methylated spirit must have a licence.

Methylene Blue. Aniline dye first prepared by Caro in 1876. It is much used in cotton dyeing and calico printing on account of its fastness to light, is of considerable value as a staining material in bacteriological work, and is used as a biliary disinfectant.

Methyl Methacrylate Plastics. Class of synthetic materials. Although methyl methacrylate, chemical formula $\text{CH}_2 : \text{C}(\text{CH}_3)\text{COOCH}_3$, has been known since the mid-19th century, it was not until 1901 that the process of its controlled "build-up" was discussed and examined. Since then, but more particularly from the 1930s the process has become the basis of a number of industries with widely-used products.

Methyl methacrylate in its simple molecular form by the application of heat, ultra-violet light, or certain chemical catalysts can be converted through progressively syrupy stages to the solid stage. This is the so-called polymer, *i.e.* it is built up from many simple molecules, and the process is referred to as polymerisation (*q.v.*). The methyl methacrylate plastics are thus a series of polymers based on this simple chemical. According to the conditions of preparation the polymer can be made available as a solution in a volatile solvent, as a syrup, as a dough, or as a solid, and at each stage can be worked up as such into end products ranging in variety from a

complete denture to the astraldome in a bomber aeroplane.

The liquid methyl methacrylate, containing a suitable catalyst (usually benzoyl peroxide) in controlled amount, is poured into a shallow glass tray and subjected to ultra-violet light under such conditions that the molecular build-up takes place gradually. Finally transparent sheets are obtained, having the highly polished surface of the mould. These sheets are thermoplastic, so that they become flexible at 120–140° C., in which condition they can be pressed or pulled into a desired shape, which will be retained when the temperature has returned to normal. There are also possibilities of working these materials at what may be regarded as a half-way stage. Fortunately the polymer is soluble in the liquid monomer, a fact which has been made use of in the production of dentures.

Methyl Salicylate. Chief constituent of oil of wintergreen, distilled from the bark of *Betula lenta*. It possesses a characteristic odour, and is a sovereign remedy in the treatment of rheumatism and in the relief of rheumatic pain. Methyl salicylate is made artificially by dissolving salicylic acid in methyl alcohol, then gradually adding sulphuric acid, maintaining at a moderate temperature for 24 hours, and distilling in a current of steam. The product is nearly identical with that prepared from oil of wintergreen.

Mētis (Gr., wisdom). In Greek mythology, one of the daughters of Oceanus, the first wife of Zeus. She was so wise and prudent that Zeus, fearing she might bring into the world a child destined to become wiser than himself, devoured her when she became pregnant, the result being that Athena was born from the head of Zeus.

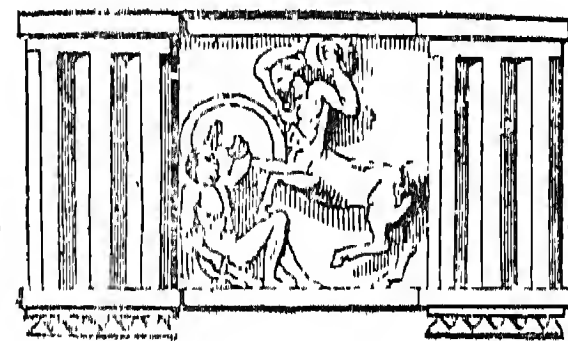
Metol. Salt of p-methylaminophenol used as a photographic developing agent. It is prepared by boiling together for about an hour p-amidophenol and chloroacetic acid. On cooling p-hydroxyglycine crystallises out, and on melting this at 245° to 247° C. carbonic acid and metol base result as products of decomposition. The average amount of metol required per ounce of developer is 2½ grains. It is a "soft" working developer, and is therefore frequently used in combination with hydroquinone.

Metonic Cycle. Cycle of 19 solar years, approximately equal in duration to 235 lunar months. About 432 B.C. a Greek astronomer Meton discovered that the moon

passes through the same cycle of changes every 19 years, so that after 19 years the phases of the moon recur on approximately the same date. The cycle is used in the determination of ecclesiastical feasts, since Easter Sunday is chosen to follow a full moon, the first moon after the spring equinox. See Golden Number.

Metonymy. Figure of speech in which an attribute is used in place of the person to whom it applies. Examples are "the bench" to mean the body of judges who sit on the bench, and "the purple" for an emperor because he wore purple robes.

Metope (Gr. *metopē*, space between two beam-ends). Term in architecture applied to the slab or



Metope. Specimen of the Doric type

tablet of stone or marble filling the space between two triglyphs (*q.v.*) of a Doric frieze. In the most ancient buildings the metope was an open space, but in extant classic architecture it is a slab which is either blank or bears a decorative design, sometimes painted, but more often sculptured in high or low relief. See Entablature; Frieze.

Metre (Gr. *metron*, measure). Word used in two special connexions: (1) The standard unit of length adopted by the French convention in 1799. (See Metric System.) (2) The arrangement of groups of one or more syllables, measured by stress or by quantity, in definite forms constituting lines and verses, which are the units of metrical compositions. This subordination of rhythm to law constitutes the capital difference between verse and prose. See Poetry; Prosody; Rhythm; Verse.

Metric System. Connected system of weights and measures based upon an arbitrary unit, the metre. Any set of measurements involves two considerations, the unit of measurement, and the relation between multiples of the unit. In the British system the unit of length is the foot and that of weight the pound; and the numbers of feet in a yard, furlong, and mile bear no common relation either to one another or to the number of pounds in a stone, cwt.,

or ton, so making calculations and comparisons difficult to carry out quickly. The metric system aims at simplification, the various units are rationally connected, and the scale of numeration is the same for most units. This common scale involves merely the decimal system of notation, the familiar system of counting by tens, where the value represented by a figure depends upon its position to the right or left of the unit's place.

In the metric system we have as names and symbols K = kilo = 10^3 , H = hecto = 10^2 , D = deca = 10, where kilo, etc., are derived from Greek; and d = deci = 10^{-1} , c = centi = 10^{-2} , m = milli = 10^{-3} , where milli, etc., are derived from Latin, designated by a small letter and used for quantities less than the unit. The quantity 5,432.768 metres can be immediately read as 5 kilometres, 4 hectometres, 3 decametres, 2 metres, 7 decimetres, 6 centimetres, and 8 millimetres. If the quantity is not a length, but a weight, then the only change necessary is the substitution of the word grams for the word metres. The use of the decimal system makes for simplification; 5,432.768 feet is equal to 1 mile 152.768 ft., or 1 mile 50 yards 2.768 ft., and a certain amount of calculation is necessary to discover these equivalents.

History of Metric System

The metric system was invented towards the close of the 18th century, a committee of five being appointed in 1790 by the French government to determine the unit of length. In 1793 a commission of twelve considered the units then in use, and in 1798 an international commission representing ten European states reviewed the work accomplished by these bodies. On June 22, 1799, the metric standards were ceremonially deposited in the French archives. An act passed in 1837 made the new system obligatory throughout France. The fundamental unit, the metre, was selected as the ten millionth part of a quadrant of the earth's circumference, *i.e.* of the distance between the equator and the pole. This was hailed as a natural unit, but later investigations showed that this quadrant varies in length, with the consequence that the metre is defined as the distance between two marks upon a bar stored in the observatory of the international bureau of weights and measures at St. Cloud; it thus became quite arbitrary.

Originally it was intended that units of weight and capacity should

be derived from the metre. Because the mass of the standard kilogram in Paris is not exactly that of 1,000 c.c. of water at standard temperature and pressure, the simple relationship does not quite hold. One litre is the volume of one kilogram of water at maximum density and equals 1000.028 c.c. Other units, such as the are, for square measure, and stere, for cubic measure, are convenient renamings of multiples of the primary units. In superficial and volumetric measures the decimal notation is modified; with areas the multiples change by 100 at a time, *e.g.* 100 sq. m. = 1 sq. Dm. and 100 sq. mm. = 1 sq. cm.; or 64.73 sq. Dm. = 6,473 sq. m. = 0.6473 sq. Hm.; and with volumes the change is by 1,000 at a time, *e.g.* 1,000 c.c. = 1 cu. dm.; or 847.283 c.c. = 847,283 cu. mm. = 0.847283 cu. dm. The metric system has been extended to currency, for 100 centimes = 1 franc and 100 centesimi = 1 lira, etc.

The facility with which the metric system can be used has led to its adoption internationally by scientists, and as the national system by most countries, the chief exceptions being the U.K. and British commonwealth, the U.S.A., and Russia. Efforts have been made to secure universal adoption of the system, but without success.

METRIC ABBREVIATIONS. K = kilo, H = hecto, D = deca, M = myria (ten thousand), d = deci, c = centi, m = milli; m. = metre, c.c. = cubic centimetre, g. = gram, Kg. = kilogram, l. = litre, Hl. = hectolitre, a. = are, s. = stere, t. = tonne, q. = quintal.

METRIC EQUIVALENTS. 1 a. = 100 sq. m. 1 sq. Km. = 100 Ha. 1 t. = 10 q. = 100 Kg. 1 s. = 1 cu. m. = 1,000,000 c.c. 1 μ = 1 micron = 0.000001 m. 1 μ g. = 1 microgram = 0.000001 g.

METRIC AND APPROXIMATE ENGLISH EQUIVALENTS.

1 m. = 39.37 inches = $3\frac{1}{4}$ ft.
1 Kg. = 2.2046 lb.
1 tonne = 0.9842 tons.
1 Km. = 0.62138 miles = 5 furlongs.
1 sq. Km. = 0.3862 sq. miles = 247.17 acres.
1 Ha. = 2.471 acres.
1 l. = 0.2199 gallons = $1\frac{1}{4}$ pints.
1 g. = $15\frac{1}{2}$ grains.

Bibliography. Outlines of the Evolution of Weights and Measures and the Metric System, W. Hallock and H. T. Wade, 1906; Metric Tables, Molesworth, 5th ed. 1918.

Métro. Popular name for the Paris underground electric railway, properly called Métropolitain. Its

14 lines cover 165½ km., linking all quarters of the city, with 341 stations. A standard fare is charged regardless of the length of the journey; books of season tickets are obtainable. The trains are designed primarily to accommodate standing passengers, and there is only one class. Construction of the Métro began in 1898; the first train ran on July 19, 1900.

Metronome. Instrument for indicating the exact pace of music. Experiments in its construction



Metronome. Form of instrument for measuring musical time

Boosey & Hawkes

date back to the 17th century, or perhaps earlier. About 1812 Winkel, an Amsterdam mechanic, experimented successfully with a pendulum suspended by its centre, having a weight at each end. By sliding

one of the weights, all rates of speed are obtainable with quite short rods. This principle was appropriated as his own invention by J. N. Mälzel (1772-1838). Some early metronomes had arbitrary rates of time, but the minute is now adopted as the standard, so that the indication $\text{♩} = 88$ (for example) means that the pace is to be 88 minims to the minute.

Metropolitan. Term for the chief bishop of a country or province. In the Greek Church a metropolitan is intermediate between a patriarch and archbishop, but in the R.C. Church is equivalent to an archbishop. In the Anglican communion he is generally the head of an ecclesiastical province, whether archbishop or bishop. Thus the archbishop of Sydney is metropolitan of New South Wales. The metropolitans in England are the archbishops of Canterbury and York. See Archbishop; Bishop; Patriarch; Primate.

Metropolitan Asylums Board

Body of men and women which, during 1867-1929, managed certain hospitals and institutions in London. It provided an ambulance service, hospitals for imbeciles, for those suffering from infectious diseases, and for certain classes of sick children. It had also homes and schools for defective children, and managed casual wards and sanatoria for consumptives. In 1929 the functions of the board were absorbed in the welfare services of the L.C.C.

Metropolitan Board of Works.

Body established in 1855 to supervise the drainage, buildings, etc., of London, to which a definite area was then given. The members were elected by the vestries and district boards of the various parishes in the metropolis. In 1888 an inquiry into the working of the board revealed an unsatisfactory state of affairs, and it was replaced by the London County Council (*q.v.*).

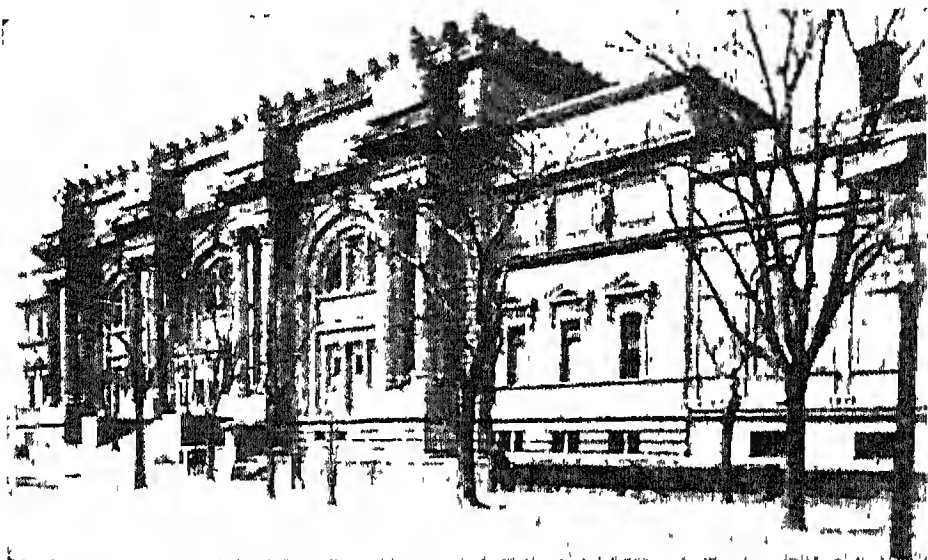
Metropolitan District Railway.

Former name of a section of the London Transport system. Inaugurated in 1868, it was closely associated with the Metropolitan line (opened in 1863), the two combining to form a rough circle serving districts of inner London. Leaving the inner circle at High St., Kensington, a main line went to Ealing and S. Harrow, branch lines serving Richmond and Hounslow. Another branch from S. Kensington ran to Wimbledon. The track was not laid far below ground, but was constructed on the "cut-and-cover" system in cuttings, these being roofed and sometimes built upon. Motive power at first was steam. The inner circle was completed in 1884, and the extension from Ealing to Harrow was opened in 1903. In 1933 the line was amalgamated with other London transport systems.

Metropolitan Museum of Art. Museum in New York, one of the most important in the world. It stands in Central Park, opposite 82nd Street, on a site in which there is plenty of room for expansion, and is notable for the number of its special collections. These include the Cesnola collection of Cypriote antiquities, said to be the largest of the kind ever made; and the Riggs collection of armour, illustrating European, Japanese, and Chinese work, and including suits of mail belonging to Philip II of Spain and Henry II and Henry IV of France. The comparatively small but excellent general collection made by Benjamin Altman, and by the terms of his bequest displayed as a whole, is rich in Rembrandts, and includes fine specimens of the work of Hals, Angelico, Botticelli, and Dürer.

J. P. Morgan's principal gift to the museum was perhaps Raphael's

Colonna Madonna, but he enriched almost every department of it, and his donations were of the value of well over £2,000,000. The tapestries from Burgundian and Alsatian looms and the collection of china are some of the most interesting of his contributions. The Morgan collection fills an entire wing. Another wing, the gift of Mr. and Mrs. Robert W. de Forest, is devoted to early American decorative arts. Mention should be made of the costume institute, the print study room, and special collections associated with the names of Theodore Davis, Michael Friedsam, H. O. Have-



Metropolitan Museum of Art, New York City, U.S.A.

meyer, and George Blumenthal. A branch of the museum, in Tryon Park, is the Cloisters, reconstructed with original elements from medieval French monasteries.

The museum is strong in pictures. Rosa Bonheur's Horse Fair is one of its chief treasures, and it has some good Van Dycks and Rubenses. Its modern pictures include one or two splendid Meissoniers and Détaillés, a few Whistlers and Sargents, and a representative collection of contemporary American art. Archaeological galleries contain frescoes from the Pompeian villa at Boscoreale and a bronze-plated Etruscan biga or ceremonial chariot of the 6th century. A gallery of architectural casts includes the Portico of the Erechtheum, and models of Notre Dame and of the Parthenon. Plans in 1947 provided for a new building to house the present contents and also the Whitney museum of American art, making five museums in one.

Metropolitan Opera House.

Building in New York. It covers the block between 39th and 40th Streets on Broadway. Completed in 1883, it was partly destroyed by fire and restored in 1893. Its ground-plan affords, from many balcony seats, a whole view of expensive boxes, but only a half view of the stage; this contact of the poorer community with the

wealthy was an avowed aim of the founders. The star system, under which patronage was asked only for individual artists, ceased to pay by 1935, when a repertory company was formed, all on yearly contracts. Caruso, Melba, and Arturo Toscanini had been launched into world fame under the earlier system. Ballet is given, and operas in English, French, Italian, German, and Russian. Broadcasts of matinee performances have yielded \$90,000 a year. Bernard Shaw gave his single American lecture from the stage of the Metropolitan Opera House.

Metropolitan Police.

Name given to the force responsible for policing the metropolitan area of London. This area, which is the London police district, constitutes one of the many "Londons," and includes roughly all territory within a 15-m. radius of Charing Cross, excluding the City of London. The area is about 700 sq. m. and its pop. almost 9,000,000. The metropolitan police have jurisdiction over the Thames between Dagenham and Teddington Lock and are employed in H.M. dockyards. The force has an establishment of some 21,000 men and women, the latter numbering about 150 in 1947. It is controlled by a commissioner, with one deputy and three assistant commissioners.

In addition to the usual police work the metropolitan police are responsible for the regulation of traffic and for the issue of licences to vehicles plying for hire. The force is divided into 29 divisions, each under a superintendent. Most of these divisions are represented by letters of the alphabet, e.g. A for Whitehall.

At the outbreak of the Second Great War the police war reserve and the special constabulary reserve were mobilised; and the women's auxiliary police corps formed. Owing to the greater calls imposed on the regular police by the German air attacks in the metropolitan area, more duties had to be undertaken by the reservists and specials than had been first anticipated. Shortage of manpower after the war led to the retention of a number of war reservists in the force. See Detective New Scotland Yard; Police.

METROPOLITAN MAGISTRATES' COURTS. Name given to the courts in London within the metropolitan police area. Until 1944 they were called metropolitan police courts. (The City of London, which is outside the metropolitan police area, has its own courts at the Mansion

House and the Guildhall where the lord mayor or an alderman sits).

Bow Street, the chief magistrates' court, developed out of the public office to which paid magistrates were appointed in the 18th century. At the end of that century a number of other courts were established in different parts of London—Westminster, Clerkenwell, Whitechapel, etc.—with paid justices. The Thames court was established at Wapping in 1800, to deal with crime on the river.

In 1821 the old court at Shadwell was established, and a new one at Marylebone; Greenwich and Woolwich, S.W. London, and W. London were established in 1841, and N. London in 1888. That at West Ham is outside the county borough of London, but within the metropolitan police area. At Bow Street (*q.v.*) are four magistrates, the senior of whom is the chief magistrate for London (outside the City).

A magistrate sits to give advice for a short time before he begins to take the cases to be considered.

A metropolitan magistrate is appointed by the crown on the advice of the home secretary. The person appointed must be a barrister of not less than seven years standing. In 1953 there were 12 courts and 26 magistrates.

The chief magistrates' court at Bow Street has certain special powers. It may issue a warrant for the arrest of a fugitive offender who is accused abroad of some crime so that he may be handed over to the authorities of the foreign country for trial.

It may also grant a licence for young persons between fourteen and eighteen to go abroad to take part in theatrical entertainment.

The first woman metropolitan magistrate, Miss Sybil Campbell, was appointed in 1945.

The chief magistrate receives a salary of £2,300 a year. The salary of the others is £2,000 a year.

Metropolitan Railway. Former name of a section of the London Transport system. The first underground passenger rly. in London and the world, its first section, from Bishop's Road, Paddington, to Farringdon Street, was opened in 1863. The company soon extended its system, reaching South Kensington in 1868, and Aldgate in 1876. The inner circle was completed in 1884, with the section between Aldgate and the Mansion House. In 1868 the extension to St. John's Wood was

opened, and this was gradually pushed out into the country. In 1904 the extension to Uxbridge was opened. The electrification of the line, begun in 1905, was completed as to the inner circle by Sept. that year. Electrification of other sections followed.

Jointly with the L.N.E.R. the Metropolitan rly. co. owned the line which serves Middlesex and Buckinghamshire, from Harrow to beyond Aylesbury. The Great Northern and City, a tube line connecting Moorgate in the City with Finsbury Park, belonged to this company. The total mileage owned, partly owned, or worked, was 179 when the company was absorbed by the London Passenger Transport Board in 1933. See London Transport; London Railways. colour map.

Metropolitan Tabernacle, THE. Baptist place of worship, Newington Butts, London, S.E. It was opened Sept., 1900, on the site of a similar structure, built in 1860–61, at a cost of £31,000, for C. H. Spurgeon (*q.v.*) and destroyed by fire, April 20, 1898. The second structure, which cost £44,576 and had accommodation for 6,000, was burnt out on May 10, 1941, during a German air raid. Plans for rebuilding were announced in 1957.

Metropolitan Water Board. Municipal body established in 1902 to take over the task of supplying London with water. It began work in 1904, when the first board was elected. It consists of 66 members, chosen for three years by various authorities in the Metropolis. Among these are the London County Council, which elects 14; the 28 metropolitan borough councils, which elect one each; the county councils of Middlesex, Kent, Surrey, Essex, and Hertford, the Thames and Lea conservancies, and others. The board provides water from the Thames, Lea, and wells for nearly 6,500,000 persons in 560 sq. m. in the counties of London, Middlesex, Surrey, Kent, Essex, and Hertford. It has an income of over £7,000,000, and a debt, mainly incurred in buying out old companies, of over £55,000,000. The George VI reservoir at Staines was opened on Nov. 7, 1947. It has a storage capacity of 4,466,000,000 gallons, is 2,037 yds. long, and from 722 to 962 yds. wide. The offices are at New River Head, Rosebery Avenue, London, E.C.1.

Metsu, GABRIEL (1630–67). Dutch painter. Born at Leyden, he was a pupil of Gerard Dou, and in 1657 went to Amsterdam, where he died. His work shows the

influence of various painters. At first he worked in the neat and smooth manner of Dou, but about 1655 he came under Rembrandt's influence. Later he reverted to a more minute and finished manner. His pictures are refined studies of domestic life. Examples may be seen in the National Gallery and Wallace Collection, London.

Metternich, CLEMENS WENZEL LOTHAR, PRINCE (1773–1859). Austrian statesman. Of a diplomatic family, he was born at Coblenz May 15, 1773, and brought up at the courts of German princes before working with his father at the embassy in Brussels. He married in 1795 a grand-daughter of the great Kaunitz, thus assuring himself of a future at the Viennese court. Envoy to Saxony 1801, he was transferred to Berlin in 1803 and to Paris, at Napoleon's request, in 1806. Then began his long understanding with Talleyrand. War breaking out in 1809, Metternich was imprisoned at first but later exchanged for French diplomatists. He was Austrian foreign minister, a post he held for 39 years, for much of which time he was also chancellor.



Prince Metternich, Austrian diplomatist

Because he bottled up the forces of nationalism, Metternich has become the bogey-man of the Liberal historians. Indeed he stood for a system that was bound to pass, but while delaying its end he kept the peace of Europe from the congress of Vienna, 1815, to the revolutions of 1848. He was the perfect diplomatist, suave, subtle, versatile in method, but inflexible in purpose, which was to hold together an empire of some dozen subject races.

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In 1815 he frustrated the schemes of Russia and Prussia in Germany; refused to force impossible terms on France; and converted the tsar Alexander's Holy Alliance to his own practical ends. Thereafter his policy was the static one of preserving the concert of great powers, policing Europe, supervising the press and the universities, resisting demands for constitutions. If his position was weakened by Canning's liberal tendencies and by troubles in the Near East, the ease with which Metternich suppressed revolutions in 1830 measured his success. He was brought down by the rising

of 1848 in Vienna itself, went for a few years to London and Brussels, and, taking no more part in government, died June 11, 1859. His Memoirs were translated in 1880; and lives in English include those by G. B. Malle-son, 1888; A. Cecil, 3rd ed. 1947.

Mettur Dam. An irrigation scheme on the Cauvery river, Madras state, India. Completed in 1934, it is 230 ft. high and can impound 93,500 million cu. ft. of water. Canals fed by the dam irrigate some 300,000 acres. Part of the water generates hydro-electric power, the power house having been in operation since 1937.

Metz. French city and fortress, capital of Moselle dept. It is 38 m. W. by S. of Saarbrücken, and lies on the river Moselle in

architecture resulted, during the period 1871-1918, when Metz was the capital of German Lorraine. Pop. (1954) 85,701.

The Gallic Divodorum (castle of the gods), Metz was the capital of the Mediomatrici tribe, later a Roman and Frankish town, capital of Austrasia from 511, and mentioned as a bishopric first in 535. Capital of Lorraine 843, of the Eastern Franks 870, French 911-923, it became a free city of the Empire in the 13th century. Here Charles IV held the diet of 1356 promulgating the Golden Bull. Henry II of France occupied the town in 1552, and in 1648 France was confirmed in possession. Vauban fortified it; the Allies in 1814-15 besieged it in vain; in 1870, under Bazaine, it capitulated to the Germans.

Occupied again by the Germans during the Second Great War, June 17, 1940, Metz lay within the occupied zone of France under the terms of the armistice of June 21. The recapture of Metz in 1944 was one of the hardest fought battles of the Allied campaign in France. The U.S. 3rd

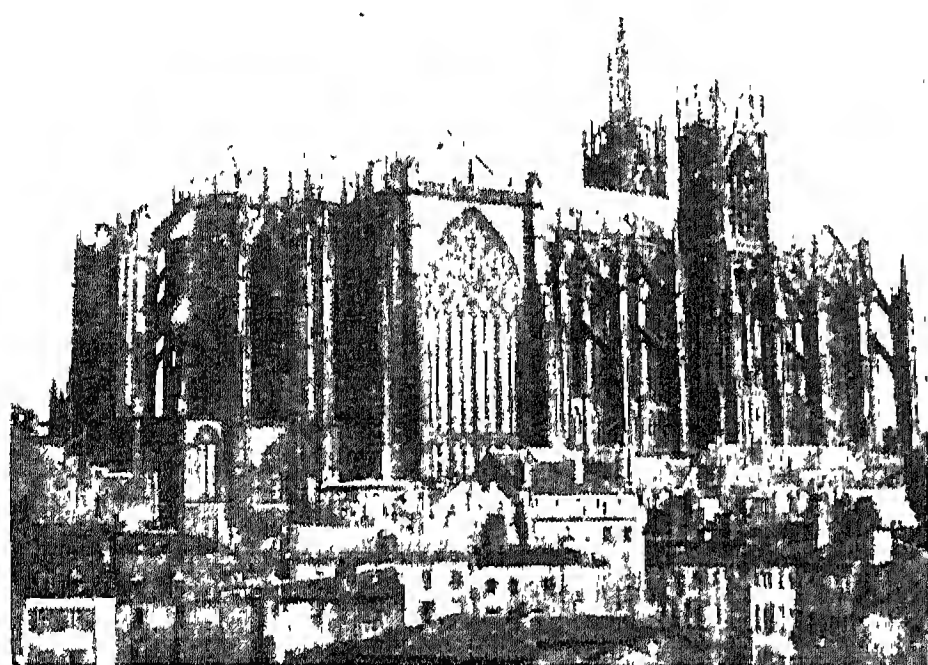
army, under Patton, was unable to overcome the linked forts W. of the city by direct attack. The moated Fort Driant in particular offered fierce resistance; U.S. infantry forced the moat and stormed its outer defences Oct. 3,

gaining control of part of the fort by the 7th, but were compelled to withdraw after a grim ten days' battle inside the fortress. Maizières-Metz, to the N. of the city, then became the focus of intense fighting. It was captured, reduced to rubble, on Oct. 30. On November 8 a "pincer" drive on Metz began from Maizières-Metz on the N. and across the Nied Francaise river to the S.E. Fort Driant was bypassed, and Metz was formally declared liberated on Nov. 22.

Metz, CAMPAIGN OF. Series of battles between French and Prussian armies in the war of 1870. After the disasters of Aug. 6, the French were obliged to retire. Bazaine was directed to move the French left and centre on Châlons to unite with MacMahon, but himself to pass through Metz to prepare the fortress for a siege. The Germans moved forward on a broad front, the 1st army direct on Metz, the 2nd towards Pont-à-Mousson, the 3rd on Nancy.

Bazaine, having halted E. of Metz on Aug. 13, was ordered to retire on Verdun. His movement through Metz began next morning, but advance guards of the 1st German army had already attacked, forcing the French on the right bank of the Moselle to face them in the battle of Colombey-Nouilly on the slopes E. of Metz. Both sides claimed a victory here, but the French withdrew to continue their retreat. Meanwhile the 2nd German army was crossing the Moselle about Pont-à-Mousson.

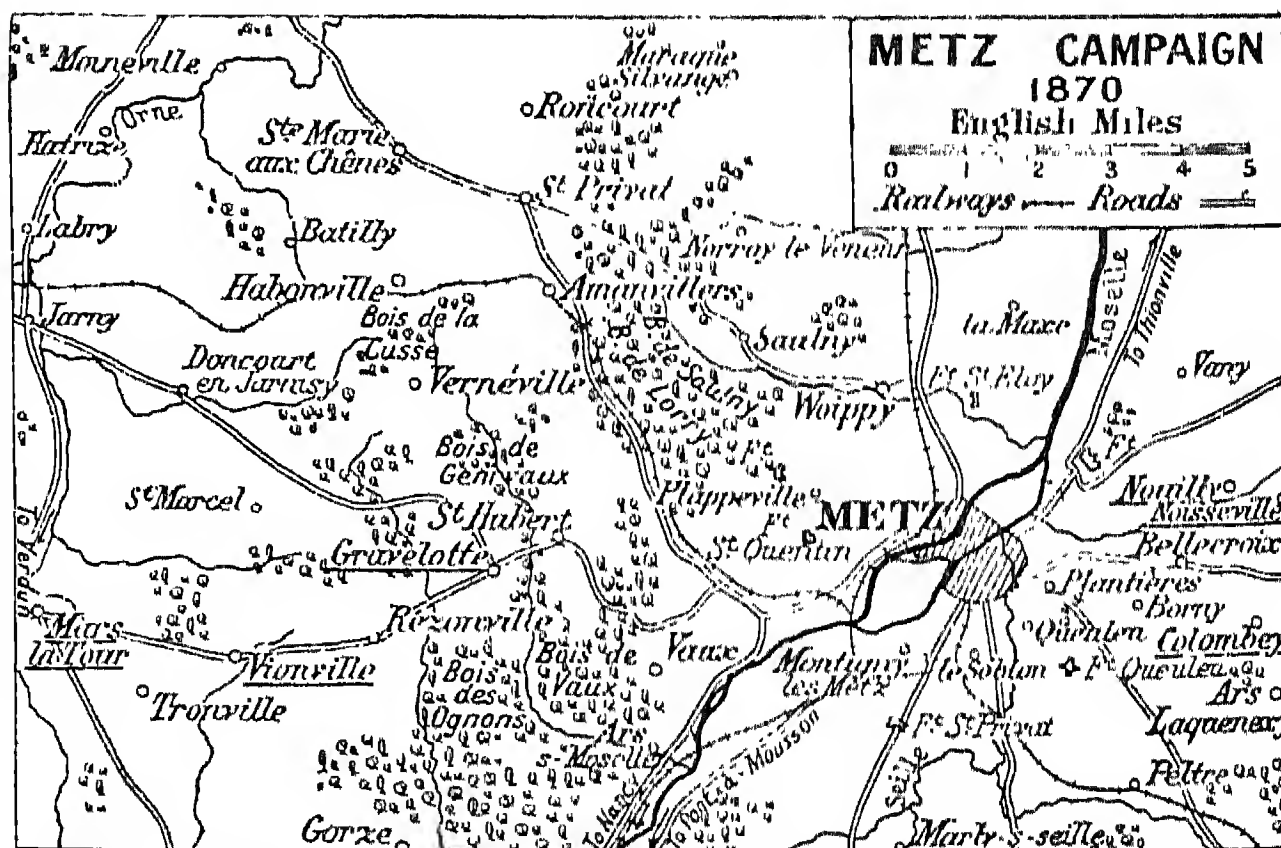
On the 16th, German cavalry from Pont-à-Mousson observed the French moving towards Verdun by the two roads from



Metz. The cathedral of this French fortress city, seen from the south

hilly surroundings, and on rlys. to Paris, Belgium, Luxemburg, and Switzerland. With a number of forts and the military aerodrome of Fresnes, Metz was considered one of France's main military strongholds. It is the trading centre for a fertile agricultural area and wine-growing neighbourhood, and has shoe, preserve, and other factories, including a government tobacco factory. The seat of a bishopric and a court of appeal, it has a permanent theatre, public library, two museums, and many schools.

One of Europe's oldest towns, its inner parts have narrow winding streets leading into the square on which stands the huge cathedral of S. Stephen (13th to 16th centuries), an impressive Gothic pile with a 295-ft. tower, which contains great treasures. S. Martin, S. Segolena, and S. Vincent are other medieval churches; that of Notre Dame, in Renaissance style, dates from 1665 to 1739, and the town church is early 18th century. Good



Metz Campaign. Area of the fighting between the French and the Germans in 1870

Gravelotte to Mars-la-Tour and Doncourt, and the right wing of the 2nd army brought about the battle of Vionville-Mars-la-Tour, in which the French lost nearly 17,000 and the Germans 16,000, after a day of fierce attack and counter-attack. Bazaine thereupon began a retrograde movement towards Metz, reaching early on Aug. 17 a strong position from the Bois de Vaux in the S. to St. Privat and Roncourt in the N.

By the evening of the 17th five German corps of the 2nd army were in line along the Verdun road from N. of Mars-la-Tour to Vernéville, while two corps of the 1st army had also crossed the Moselle and taken up a position on the right S. of Gravelotte. The battle of Gravelotte followed, Aug. 18, the first battle of the war to be fought according to plan. The king of Prussia, with von Moltke, was now with the troops. The Germans won the battle by an extending series of northward marches in échelon of corps until the French right was turned, though the centre and left maintained their ground. Ste. Marie-aux-Chênes, St. Privat (stormed by the Prussian guard, who lost half their number), and Roncourt all fell before nightfall. The numbers engaged in this battle had then scarcely ever been exceeded, for 220,000 Germans attacked 140,000 French in a chosen position. German losses were over 20,500 killed, wounded, and missing, while French casualties numbered only 7,853 killed and wounded, and 4,419 prisoners; but Bazaine had been compelled to fall back into Metz.

The investment of the fortress began next day, the Germans keeping only a number about equal to the French to hold a circumference of 28 m. On Aug. 26 Bazaine pushed back the German outposts to the N.E. in the hope of helping MacMahon's army of Châlons by keeping the Germans E. of the Moselle. On Aug. 31 the day before Sedan fell, he attempted to break out towards Thionville, but had given the Germans too much warning. At the outset, about 4 p.m., the French captured villages to the N.E., but during the night German reinforcements were rushed to the scene. Next day, while the Châlons army was being crushed at Sedan, Bazaine renewed the fight half-heartedly, but withdrew once more to Metz by midday, after engaging about 120,000 men against only 70,000

Germans. One more half-hearted attempt to break out was made on Oct. 7, but three days later a council of war decided to treat for terms of peace. On Oct. 27 the whole of Bazaine's army of the Rhine, 173,000 strong, became prisoners of war, and Metz was handed over to the Germans. See Bazaine; Franco-Prussian War; Moltke.

Meudon. Town of France, in the dept. of Seine-et-Oise. It lies 3 m. S.W. of Paris, and 1 m. S. of Sèvres, and is connected with Paris by rly. It has chalk works, and an observatory and magnetic laboratory. Rabelais was priest of the parish, and is commemorated by a monument in the 16th century church. The 17th century château of Meudon was destroyed by the Prussians in 1871. Pop. 20,797.

Meulebeek. Town of Belgium, in the prov. of W. Flanders. It lies 8 m. N. of Courtrai, on the Ingelmunster-Thielt rly. The industries include cotton and linen spinning and lace making. Meulebeek was in German occupation throughout the First Great War. Pop. 9,300.

Meulen, ADAM FRANS VAN DER (1632-90). Flemish painter. Born in Brussels, Jan. 11, 1632, he was apprenticed to P. Snayers, and in 1667 went to Paris to accept a post in the Gobelins factory. He painted battle scenes of which he acquired a knowledge by accompanying Louis XIV on campaigns. He died in Paris, Oct. 15, 1690. Characteristic examples of his work are in the galleries of Munich, Versailles, and the Louvre.



A. F. van der Meulen
Flemish painter
After Largillière

Meunier, CONSTANTIN (1831-1905). A Belgian sculptor and painter. Born at Etterbeek, Brussels, April 12, 1831, he first appeared at the Brussels Salon in 1851 with a piece of sculpture, *Guirlande*. For a time he abandoned sculpture to paint scenes from the life of the Trappists, and also of peasant life in Spain. He portrays scenes from the life of workers in coal mines, his studio in Louvain being in the heart of the Belgian black country. His chief works include *Grison*, *Le Débardeur*, *Ecce Homo*, *Le Cheval de Mine*, *L'Apothéose du Travail* (with four figures of *La Mine*, *Le Port*, *L'Industrie*, *La Moisson*), in the Museum of Decorative Arts in

Brussels. He died in Brussels, April 4, 1905.

Meurthe. A river of France. Rising in the Vosges, N.E. of Gérardmer, it flows in a N.W. direction into Lorraine. It is joined by the Vezouse near Lunéville, and meets the Moselle near Frouard. The chief towns on its banks are Fraize, St. Dié, Baccarat, Lunéville, and Nancy. Its length is 102 m.

Meurthe-et-Moselle. Dept. of France, formed in 1871 after the remaking of the E. frontier of France. It is bounded N. by Belgium and Luxemburg, E., S., and W. by the depts. of Moselle, Vosges, and Meuse. It is generally hilly and well wooded, particularly in the S., where lies part of the Vosges Mts., and is well cultivated, potatoes, cereals, beets, and the vine being grown. Iron, salt, and building stone are mineral products, and among the varied industries are brewing, timber working, and the making of chemicals, textiles, and glass. The Meurthe, Moselle, Mortagne, Madon, Sanon, and Chiers are among the rivers; the Canal de la Marne traverses the dept. Nancy is the capital, other towns of note being Toul, Lunéville, Briey, Longwy, Pont-à-Mousson, and Baccarat. The department was fought over at the beginning of the First Great War, as is noted in the articles Longwy, Nancy, etc. Area, 2,036 sq. m. Pop. (1954) 607,022.

Meuse (Fr.; Du. Maas). River of W. Europe. It rises about 16 m. N.E. of Langres, Haute-Marne, flows in a N. direction, for a few miles underground, through the depts. of Vosges, Meuse, and Ardennes, and passes into Belgium at Givet, after a sinuous course from Sedan. At Namur it turns N.E., through a valley between that town and Liège, and enters Dutch territory just S. of Maastricht.

The Meuse or Maas then flows N. and W. until it joins the Waal, a branch of the lower Rhine, near Gorkum, where it becomes the Merwede, and, after passing the marshy tract known as the Biesbosch, enters the North Sea at several points, the chief of its mouths being the Scheur, where stands the Hook of Holland, the Haringvliet, and the Grevelingen. Among its tributaries are the Bar, Sambre, Semoy, Lesse, Ourthe, and Roer, and among the towns on its banks are Neufchâteau, Commercy, Verdun, Mézières, Dinant, Namur, Huy, Liège, Maastricht, and Venlo. Navigable up to a point near Verdun, the Meuse

is joined by several canals, notably the Marne-Rhine canal and the Ardennes canal. Its total length is 575 m., 305 m. being in France, 120 m. in Belgium, and 150 m. in the Netherlands. The area of its basin is computed at 12,740 sq. m.

BATTLES OF THE MEUSE. Operations in the First Great War took place, Aug. 25-27, 1914, between the French 4th army under Langle de Cary and the German 4th army under the duke of Württemberg. After defeats at Virton-Ardennes, Langle de Cary received orders to establish himself on the left bank of the Meuse and maintain contact with the still retreating 5th army on his left. His front ran from Sassey to Mézières, and here was a 30-m. gap through which the Germans were pouring troops. By Aug. 26 the Germans had bridged the river at Remilly and established a bridgehead S. of Sedan; the French centre was pierced, and they were driven to form a new front along the high ground S. of the river W. of Mézières.

The Germans forced several further crossings, and began a push along the whole Meuse front. A severe check at Noyers drove them to appeal for help to Hausen's 3rd army (not yet identified by the French), which, however, continued to march S.W., threatening the French left. On the 27th Langle de Cary ordered a new attack to drive the Germans back into the Meuse. In the centre he gained ground and the Germans recrossed the river, while on the right the enemy were pushed back towards Olizy. Two corps of the German 3rd army were sent to relieve the badly mauled 4th. Possibly if the French reserves had been put in on Aug. 28, a great victory might have been won. Instead Langle de Cary, in view of Joffre's orders for a retreat, decided to fall back on the Aisne. Casualties on both sides were heavy.

The Meuse figured also in fighting in the Second Great War. On May 11, 1940, German forces crossed N. of the Albert Canal, the waterway forming the main Belgian line of defence in the N. By May 14 they had reached a stretch of the river W. of Liège, and from Namur to Sedan were within reach of the Meuse bridgeheads. The French evacuated Sedan; and a German break through resulted in the turning of the Maginot line. On Aug.

31, 1944, American armoured columns crossed the Meuse at Sedan unopposed, the Germans being in rapid retreat; further crossings followed swiftly. For operations in the Netherlands, see Maas.

Meuse. Dept. of France. Contiguous with the depts. of Meurthe-et-Moselle, Vosges, Haute-Marne, Marne, Ardennes, and with Belgium, it is generally hilly, and contains the great forest tracks of the Argonne and the Woëvre. The Meuse flows in a N.N.W. direction through the dept., and other rivers are the Ornain, Aire, Aisne, Chiers, Loison, and Orne. The Canal de la Marne traverses the dept. Cereals, beet, potatoes are grown, and round Bar-le-Duc and Bussy the vine: among industries are quarrying, timber working, and foundries. The capital is Bar-le-Duc, other towns of note being Com-



Meuse. Sketch map showing dispositions of the opposing armies in the series of battles in August, 1914

mer resort, and has long been engaged in the pilchard fishery. There is a good harbour.

Mewar. See Udaipur.

Mexborough. Urban dist. and market town of the W. Riding of Yorkshire, England. It stands on the Don, 5 m. from Rotherham and 11 m. from Sheffield, and has two rly. stns. The chief building is the church of St. John the Baptist, partly Early English. There was a castle here in the Middle Ages. Industries include the making of scissors, bricks, toys, and cardboard; around are coal mines. Market day, Sat. Pop. (1951) 18,965.

Mexborough, EARL OF. Irish title borne since 1766 by the family of Savile. The Saviles are a Yorkshire family, and one of them, Sir John Savile, was M.P. for Hedon, 1747-54. In 1753 he was made an Irish baron, and in 1766 earl of Mexborough. John, the 4th earl (1810-99), was M.P. for Gatton before 1832 and afterwards for Pontefract. In 1945 John Raphael Wentworth became the 7th earl. The family estates are in Yorkshire. The earl's eldest son is called Viscount Pollington.

Mexcala OR MESCALA. River of Mexico. Rising in the state of Tlaxcala and known as the Atoyac in its upper course, it flows for 435 m. generally W. to the Pacific. In its lower course it takes the name of Rio de las Balsas and separates the states of Michoacan and Guerrero. The swift current furnishes power for textile mills.



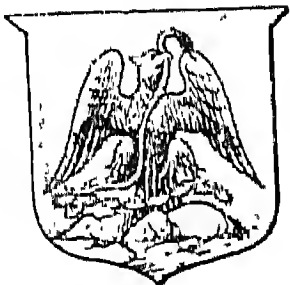
Mevagissey. The attractive Cornish fishing town and its harbour

Mevagissey. Fishing town of Cornwall, England. 12 m. E. of Truro, it is a sum-

MEXICO: IN ANCIENT & MODERN TIMES

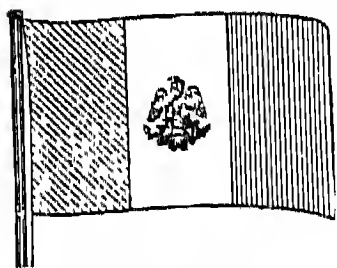
The reader should consult the articles on the cities, towns, and rivers, rulers, statesmen, and men of letters of Mexico. See Archaeology; Aztec; Maya; also Latin America; North America

Mexico is a republic of North America, occupying the southern extension of the continent toward Central America. It lies approximately between $14^{\circ} 33'$ and $32^{\circ} 43'$ N. lat., and between $86^{\circ} 48'$ and $117^{\circ} 8'$ W. long., and has an area of 763,944 sq. m. Mexico is bounded N. by the United States, the Rio Grande del Norte forming the E. part of the N. frontier; on the S.E. it is bounded by British Honduras and Guatemala. It has a coast-line of 1,727 m. on the Atlantic (Gulf of Mexico), and of 4,574 m. on the Pacific side, the length being enhanced on the E. by the peninsula of Yucatan in the S.E., and on the W. by the long, narrow peninsula of Lower California.



Mexico arms

About six-sevenths of Mexico consists of a high plateau, continuing that of the S.W. United States, and bordered E., N., and S. by mountains which slope steeply to low coastal plains. The plateau ranges in average elevation from 4,000 ft. in the N. to 8,000 ft. in the S.; the E. bordering mountains (Eastern Sierra Madre) form a broken chain with summits up to 10,000 ft.; the W. (Western Sierra Madre), less broken, have a somewhat greater general elevation; and the S. (Sierra del Sur) range from 7,000 up to more than 11,000 ft.



Mexican flag

From the S. part of the plateau itself, a region strongly volcanic, containing craters still active, and subject to earthquakes, a number of peaks rise to greater heights, e.g. Orizaba (over 18,000 ft.) and Popocatepetl (17,520 ft.). Elsewhere the surface of the plateau is much broken; it contains several inland drainage basins (*bolson*), notably the Valley of Mexico in the S., including extensive lakes and marshes; and the rivers which escape from it to the sea do so by way of falls and ravines, so that access from the coasts is difficult. The plateau falls S.E. to the low Isthmus of Tehuantepec (170 m. wide), and E. of this the land in-

cludes, on the S. the Chiapas highlands (5,000 to 8,000 ft.), and on the N. the lowland of Tabasco and the Yucatan peninsula.

The largest river on the E. is the Rio Grande del Norte (1,500 m.). The rivers of the plateau are of most service for power where they fall over its edge, but their flow is irregular according to season, and important power establishments have needed the construction of great dams and reservoirs. The streams of the coastal plains are winding and slow; some on the E., like the Pánuco, Papaloapan, Coatzacoalcas, and Grijalva, are used for inland navigation, but their mouths are hampered by bars, or need constant dredging.

The rocks of a greater part of the plateau and the E. Sierra are cretaceous, the W. heights and the S. of the plateau consist mainly of tertiary volcanic rocks. Yucatan consists of sedimentaries of the same period, and the plains have a wide extent of more recent deposits.

The climate is so markedly influenced by elevation that there is a familiar threefold division of the land—(1) the *tierra caliente*, hot land, from the coasts up to about 3,000 ft., with a warm, dry winter and hot, wet summer when temps. especially on the Pacific coast, frequently exceed 110° F.; (2) the *tierra templada*, temperate land, from 3,000 to 6,500 ft., free of the excessive summer moisture of the

lower levels and the cold winter winds of the higher; (3) the *tierra fria*, cold land, higher than (2). Hard frost is rare except at very high elevations and the designation cold is only comparative, the average temp. being c. 60° F. The chief inland towns are in zones (2) and (3); the capital, Mexico City, for example, is in the highest, being situated at an altitude of 7,500 ft. The dry season, over most of the country, lasts from Oct. to May; the wet from June to Sept. Both coastal slopes, especially the Pacific, receive heavy rainfall; but semi-desert conditions exist in the N. and N.W. parts of the plateau and in Lower California.

The average annual rainfall for the whole republic is 60 ins. Trade winds, from N. E. to S. E., prevail on the Atlantic coast, but may be replaced between Oct. and March by the tempestuous "northers." The prevalent winds on the Pacific coast are N. W. in winter, and S. W. to S. E. in summer. Hurricanes are most frequent from Aug. to Oct.

The low coastal plains, behind the bare sand-bars, carry tropical forest, which merges into subtropical and temperate types as the plateau is ascended. The dry N. has a steppe vegetation if any; farther S. the land is fertile. The porous limestone of Yucatan carries a scrubby natural vegetation. Among larger wild animals the puma, jaguar, bear, and boar are found. Poisonous snakes are common, and there are many harmful insects; the mosquito, breeding in the coastal lagoons and marshes, carries malaria and yellow fever.



Mexico. Map of the southern republic of North America, showing the railway connexions with the U.S.A. and the Atlantic and Pacific ports

The pop. at the 1950 census was 25,791,017, and in 1955 was estimated at 29,679,000, of whom c. 10 p.c. were of European (chiefly Spanish) descent; c. 15 p.c. pure Indian, of over 50 tribes and dialects; and 75 p.c. mestizos—of mixed European and Indian descent. Of the 160,000 foreigners, c. 12,700 were British; 12,500 Americans; 7,300 Germans; 5,000 French; 5,000 Italians; and 25,000 Spaniards. The crude mortality rate in 1955 was 13.3 per 1,000. The birth rate is high, but so is infant mortality. There are certain other well-marked "colonies," e.g. the Syrians (Maronite Christians) who form a strong trading class in Yucatan.

The most important food crop is maize, from which is made a staple food, the flat cake called *tortilla*. The country is not, as a rule, self-sufficing in either maize or wheat. The *frijol* and other beans are grown and eaten; oranges, bananas, the vine, agaves from which the drinks of the common people, *pulque* and *mezcal*, are distilled, sugar and coffee are cultivated for home consumption and export. Fibre plants are specially important; among these the chief is the henequen or sisal hemp of Yucatan. Cotton is grown in central Mexico; the *guayule* of the north and other wild plants yield rubber, which is also cultivated. Among vegetable gums, the *chicle* of the S.E. lowlands is the basis of chewing gum. Cattle ranching is important in the N. half of the country.

Mineral Wealth

The mineral wealth of Mexico is immense. Silver, gold, copper, iron, lead, and zinc are the most important metals, and coal and salt are found. The richest mineral region, broadly speaking, is the slope of the Western Sierra Madre. The petroleum fields produce some twelve million metric tons a year; the chief are in the Gulf coast lands, (a) in the south of Tamaulipas State and northern Vera Cruz, behind the ports of Tampico, Puerto Lobos, and Tuxpan, and (b) in southern Vera Cruz behind the port of Puerto Mexico. Unsettled conditions in the country have from time to time interfered with mining operations and the working of the petroleum fields. Water power, at Boquilla and elsewhere, has been applied to large scale generation of electricity for lighting, heating, and traction, and power in mines and factories.

There are a few large metallurgical works, e.g. the iron and steel



Mexico. One of the rural guards wearing the national hat

foundries at Monterrey and in Hidalgo; cotton factories in and about Orizaba, Puebla, and Mexico City; wool factories at Tlalnepantla. Jute, silk, leather goods, cigarettes, soap, and glycerine are other important manufactures.

Most mining and manufacturing works were set on foot by foreign organization and capital, but from 1917 onwards Mexican govts. have sought to limit these interests. Foreign companies working Mexico's petroleum were expropriated in 1938.

The chief Atlantic ports are Tampico (for the northern petroleum fields) at the mouth of the Panuco, Vera Cruz with a good artificial harbour, Puerto Mexico at the mouth of the Coatzacoalcas on the N. side of the isthmus of Tehuantepec, and Progreso in Yucatan, on an open roadstead, from which sisal hemp is shipped. The chief Pacific ports are Salina Cruz on the S. side of the isthmus of Tehuantepec (connected with Puerto Mexico by a trans-isthmus railway), Acapulco, Manzanillo, and Mazatlan.

The rlys. have not been systematically laid out, but, except in certain parts, the country is fairly well served. The main lines were nationalised in 1937.

Main trunk motor roads extend from the U.S. border to Mexico City and to most of the principal cities. That from Laredo, Texas, to Mexico City, 764 m., was opened in 1936. The Mexican section of the Pan-American Highway (q.v.),

1,745 m. long, was constructed 1942-50. These motor roads follow U.S. standards of road building and are excellent. Air services to S. and Central America were started in 1930; there are also services from Mexico City to Brownsville, Texas, and thence to New York and other U.S. cities, besides a network of internal airways. There are fairly complete land telegraph and postal systems.

CONSTITUTION. Under the constitution of 1917 and later amendments, Mexico is a federal republic, each of its states being free in respect of internal affairs. In 1951 there were 29 states, two territories (S. Lower California and Quintana Roo), and the federal district of Mexico City and a small area round it. The congress of the federation consists of a chamber of deputies, elected for a term of three years, with one member for every 150,000 inhabitants, and a senate with two members for each state, and two for the federal district, elected for a term of six years. Members of both houses are ineligible for re-election until the period of another term has elapsed. The president is elected by direct vote for a six years' term. Women received the vote in 1953.

The governors of the states are elected, those of the territories and the head of the federal district are appointed by the president. In each state the legislature and judicial authorities are elected by popular vote. Roman Catholicism is the religion of the great majority of the people. Military service in the army or national guard is compulsory. Elementary education is free, secular, and, in theory, compulsory; but 165 regimental schools were set up to combat illiteracy in the army, and in 1950 there were more than 20,000 centres for the instruction of illiterate civilian adults. There were also 14 universities, of which the national university of Mexico city, founded 1553, was the chief; women are admitted.

ANCIENT HISTORY. The earliest inhabitants of what is now Mexico were hunting mammoths in the Valley of Mexico with stone-tipped spears by about 9000 B.C., and men were living in caves in N.E. Mexico, gathering food and cultivating a little maize, by about 2500 B.C. From at least 1500 B.C. people were settled in villages in the Valley; they lived in wattle and daub houses, cultivated maize, wove cotton and bast textiles, and made good, unpainted pottery. Numerous nude female pottery

figurines may indicate a fertility cult. Figurines and pottery vessels in animal form made a few centuries later (from Tlatilco, near Mexico City) show a developed artistic sense, and by 500 B.C. mounds or pyramids were being built as platforms for shrines and ceremonies.

Centres of Early Civilization

Later generations and other peoples developed great ceremonial centres in various parts, especially Teotihuacán in the Valley and Monte Albán, the Zapotec centre in Oaxaca, which reached their climax in the first six centuries A.D.; while Yucatan and the countries beyond the border were the seat of the great Maya civilization. Teotihuacán was probably the greatest of these centres. It consists of a great paved way 2 kilometres long, flanked by two enormous pyramids and many smaller ones, platforms, courts, and temples, with domestic buildings on the outskirts. The temples were adorned with elaborate carvings and frescoes representing gods and mythological scenes. Fine plain and painted pottery was made, and some vessels were coated with stucco delicately painted with religious subjects. Among the many gods worshipped were the rain god and the feathered serpent, later called Tlaloc and Quetzalcóatl. The great centres of civilization lived at peace and traded with one another, so that Teotihuacán pottery is found in Maya centres and so on.

Possibly in the 7th century, possibly as late as the 10th, a new, warlike people, the Toltecs, arrived in central Mexico and established their capital at Tula in Hidalgo. They overthrew Teotihuacán, and transformed the life, religion, and art of the Maya in Yucatan. They adopted the cult of Quetzalcóatl, and the symbols of the eagle and "tiger" orders of warrior knights, later so important among the Aztecs, are prominent on their buildings. Further invaders arrived in the Valley in the 12th century. These belonged to fierce, nomadic, Nahuaspeaking tribes, the Chichimecs, who soon adopted much of the culture of their predecessors. They fought among themselves, until in the 15th century the Tenocheas (Aztecs) subjugated the remainder. With their capital at Tenochtitlan, the site of Mexico City, they achieved an uneasy supremacy over a wide area, exacting tribute and sacrificial

victims from the subject tribes, until conquered in their turn by the Spaniards.

MODERN HISTORY. During the 15th century the Aztecs established their rule over a great part of Mexico, and allied themselves with the kingdom of Tezcucó (near Mexico City), the culture of which was higher than their own. In the reign of Montezuma II (*q.v.*) Mexico was invaded by the Spaniards under Cortés (*q.v.*), conquered during 1519–21, and named New Spain. The country was administered from Madrid, and settlement was carefully controlled. The religious orders carried Spanish authority N. by means of missions, and by the end of the 18th century it extended far along the Pacific coast. The central provinces were the most peaceful part of Spanish N. America.

Napoleon's conquest of Spain in 1808 led in Mexico, as in Spanish S. America, to revolt, and in 1810 there was a rising, in particular against corrupt European officials. It was suppressed, but discontent remained; and in 1821, Iturbide, a former officer in the Spanish army, and ostensibly the leader of the conservative elements, joined with the rebel leader Guerrero in the plan of Iguala which proclaimed Mexico an independent monarchy. Iturbide reigned as emperor 1822–23, but was then ousted in favour of a republic. Next year a federal constitution was brought into force. Spain abandoned her claim to Mexico in 1829.

Reduction in Area

The country at that time was twice as large as it is now; it included the whole of California, part of Colorado, and the area forming the U.S. states of Texas, Arizona, and New Mexico. In 1836 Texas declared its independence, and in 1845 was admitted as a state of the U.S.A. Frontier disputes led to war between the U.S.A. and Mexico, 1846–48. The Mexicans were beaten and ceded New Mexico and California for a money payment.

In 1855 the Mexican dictator Santa Anna fell, and a period of civil war followed, until the government's repudiation of foreign debts in 1860 brought foreign intervention, and Spanish, British, and French troops landed in 1861.

Napoleon III had a vision of a Franco-American empire, and after the withdrawal of the British and Spanish armies the French took Mexico City in 1863, and installed a provisional government

which proclaimed Maximilian, brother of the Austrian emperor, as emperor. On his arrival in 1864 he made a real effort to introduce settled government, but the activities of Juárez (*q.v.*) in the N. and General Díaz (*q.v.*) in the S. made his position impossible. The French troops supporting Maximilian were withdrawn in 1866, and in 1867 he was taken and shot. In 1876 Díaz seized power and ruled as autocratic president until 1910, when he was overthrown. His attempts to regain power failing, he resigned in 1911. Under his rule the finances were rehabilitated, guerrilla warfare was put down, and economic conditions improved.

The period which followed the downfall of Díaz was again one of internal warfare, with one leader and then another gaining a temporary supremacy, until 1920 when, in spite of local revolts, a period of reconstruction began, based on the new constitution promulgated in 1917. This guaranteed the rights of labour common in progressive countries; it also declared ownership of the land to be vested in the people, as a result of which millions of acres formerly in large estates were confiscated and let for rent among the land-hungry peasants.

Mexico broke off relations with the Axis powers in Dec., 1941, and declared war on them six months later. Mexican aircraft took part in anti-submarine work in both the Pacific and the Atlantic; and a Mexican expeditionary air force served with U.S. forces in the Philippines in 1945.

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Mexico. Inland state of the republic of Mexico. Bounded N. by the state of Hidalgo and S. by Guerrero and Morelos, it covers an area of 9,230 sq. m., and encloses the greater part of the federal district and city of Mexico, which do not form part of the state. The S.E. and central portions are mountainous, the highest summit being the Popocatepetl volcano, but the N. part is relatively flat. There are a few rivers, the principal being the Lerma, and of the lakes the largest is Texcoco in the E. An important industry is stock-raising, and gold and silver mining

is carried on. Cereals, sugar, coffee, and tobacco are cultivated, and manufactures include cotton and woollen goods, glass, flour, and pottery. The national railroads of Mexico serve the state. Toluca is the capital. Pop. (1950) 1,392,623.

Mexico OR MEXICO CITY. City of N. America and capital since 1824 of the republic of Mexico. It lies within the federal district on the plateau of Anahuac, 7,350 ft. alt., and is well served by rly. and by air services both inside Mexico and with neighbouring countries. It occupies the middle of an elevated valley girt by high mts., and the most prominent features of the landscape are the 17,000-ft. volcanoes Popocatepetl and Ixtaccihuatl with their snow-covered caps.

For those suffering from weakness of lungs or heart, the high altitude may prove harmful, but for those in robust health the climate is healthy. The rainfall is 23 ins.; the mean temp. ranges from 54° F. in Jan. to 65° F. in May. The great season for tourists is during the months Nov. to March.

The city is the most ancient and one of the largest in N. America with pop. (1950) of 2,234,793. It covers an area of nearly 20 sq. m. Laid out for the most part with rectangular avenues and streets, it boasts in the Paseo de la Reforma one of the widest boulevards in the world's cities, with a length of over 3 m. terminating at the foot of the hill of the Grasshopper, on which stands the castle of Chapultepec, residence of the president, towering high above a superb park, famous for its gigantic trees, gardens, and lake. From the Plaza de la Constitución (also known as the Zocalo, the Plaza de Armas, and the Plaza Mayor), a square covering nearly 15 acres, proceed the main streets, lined with handsome department stores and shops, skyscrapers, and great hotels. The E. side of the Zocalo is occupied by the national palace, built in 1691, which houses various govt. depts. Over the central door hangs the Liberty bell, rung every Sept. 15 by the president in commemoration of the liberation of Mexico from Spanish rule. On the N. side of the Zocalo lies the cathedral, the largest on the American continent, begun in 1572 and completed in 1667; it stands on the site of an Aztec temple. The national museum near by contains a collection of Aztec and Maya relics. Among modern buildings of note are the general post office, the ministry of communications, and the palace of fine arts theatre. The

stadium for sports and the bull ring are large and well equipped.

In what is now the legislative palace the first printing press on the American continent was established in 1536 and still stands. The first American newspaper, the *Mercurio Volante*, was published from this press in 1693. W. of the Zocalo lies the Alameda, another open space of over 40 acres, consisting of a well wooded park, surrounded by hotels, offices, and shops. The residential sections of the city, laid out in American style, extend out into the country; they are reached by good motor roads and a service of electric tramways.

The old quarters retain many of the characteristics of an ancient Spanish city, but the 20th century tendency has been towards the destruction of older buildings.

The present city was founded by Cortes in 1522 on the site of the Aztec capital of Tenochtitlan, which then stood on a number of islands in Lake Texcoco. The subsoil is, therefore, marshy. This has been overcome by laying down vast interlacing steel rafts, on which the modern edifices are anchored. They are thus little affected by the earthquakes, which, however, though frequent, are rarely severe.

Mexico, FEDERAL DISTRICT OF. Territory acquired by the federal govt. of Mexico for its specific use from the state of Mexico, which encloses it on three sides; on the S. it is bordered by the state of Morelos. It covers an area of 573 sq. m. The city of Mexico and twelve villages lie within its limits. Pop. (1950) 3,795,567.

Mexico, GULF OF. Great inland gulf or sea, forming a westward extension of the Atlantic ocean. Almost entirely enclosed by land, it has the U.S.A. on the N., Mexico on the W. and S., the peninsulas of Florida and Yucatan constricting the two entrances. It has a greatest length from E. to W. of 1,150 m., a greatest breadth N. to S. of 680 m., and an area of more than 700,000 sq. m. The two channels, the Strait of Florida on the N. and Yucatan Channel on the S., formed by the island of Cuba, are shallow, but the gulf has a depth of more than 2,000 fathoms at a point between the mouth of the Mississippi and the Yucatan peninsula, and reaches a maximum depth of 2,119 fathoms in about 25° 7' N. and 89° 37' W., while the greater part of its expanse has a depth in excess of 1,650 fathoms.

Several large rivers empty their waters into the gulf, the most im-

portant being the Mississippi, Rio Grand del Norte, Colorado, Sabine, Brazos, and Mobile. Apart from the Bay of Campeche there are no pronounced indentations, and the best harbours are Galveston, New Orleans, Mobile, Pensacola, and Tampa, Vera Cruz, Key West, and Havana. The Gulf Stream passes into the gulf through the Yucatan channel and makes its exit by the Strait of Florida, its pressure giving the gulf a temperature of some 8° in excess of that of the open ocean in the same degree of latitude. See Gulf Stream.

Meyer, FREDERICK BROTHERTON (1847-1929). English Non-conformist preacher. Born in London, April 8, 1847, he was educated at Brighton and London university. Baptist minister of Victoria Road church, Leicester, in 1874, he was so successful that Melbourne Hall was specially built for him in 1878. Having been from 1888 minister of either Regent's Park chapel or of Christ Church, Westminster Bridge Road, (two periods at each), he retired in 1921. He was twice president of the national federation of Free Churches (1904, 1920), and once of the Baptist Union (1906). Leader of temperance and purity campaigns, he was largely instrumental in 1914 in preventing a boxing match between Jack Johnson, coloured heavyweight, and Billy Wells, British champion. He published Biblical commentaries and *The Bells of Is*, an autobiographical work. He died March 28, 1929.

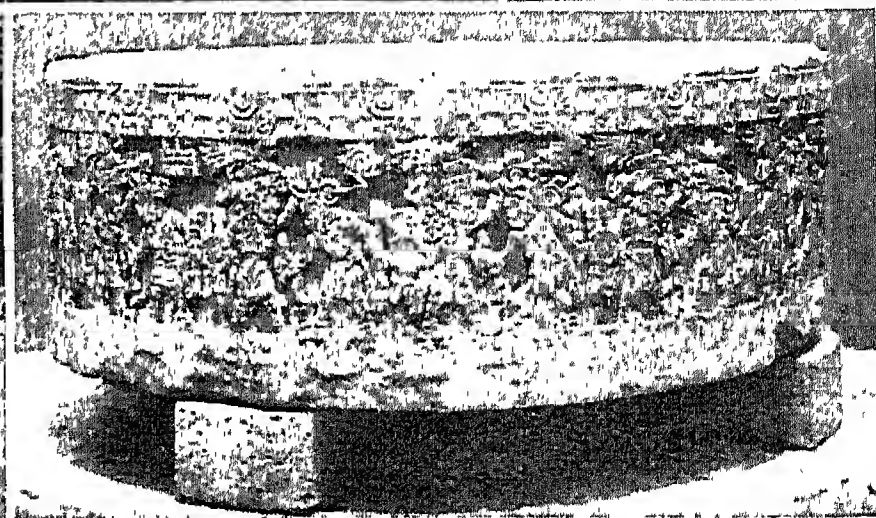
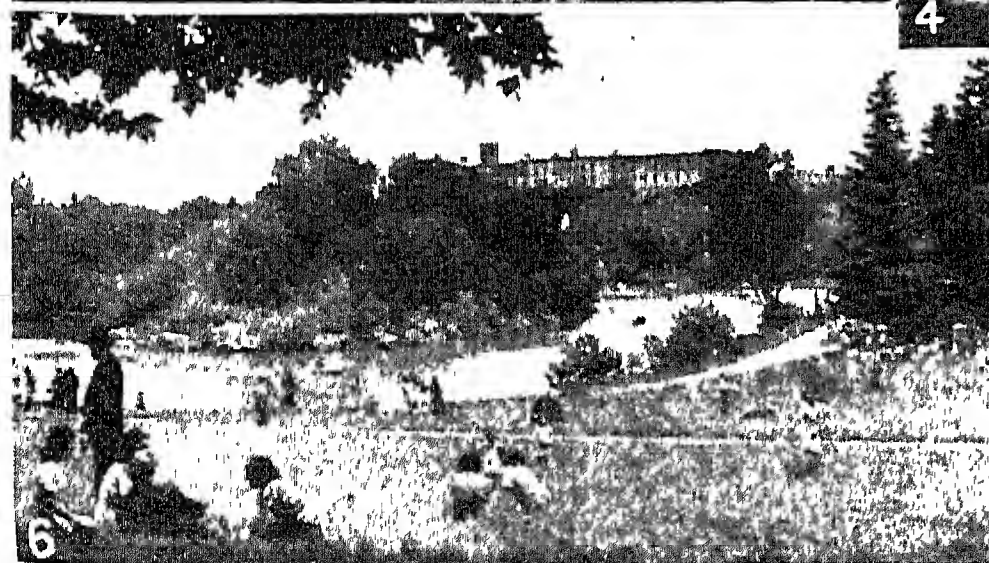
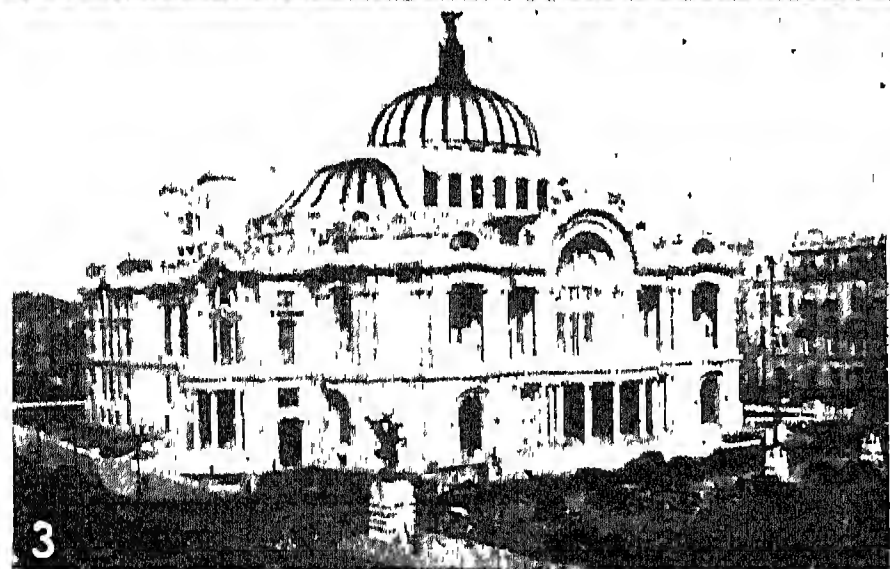
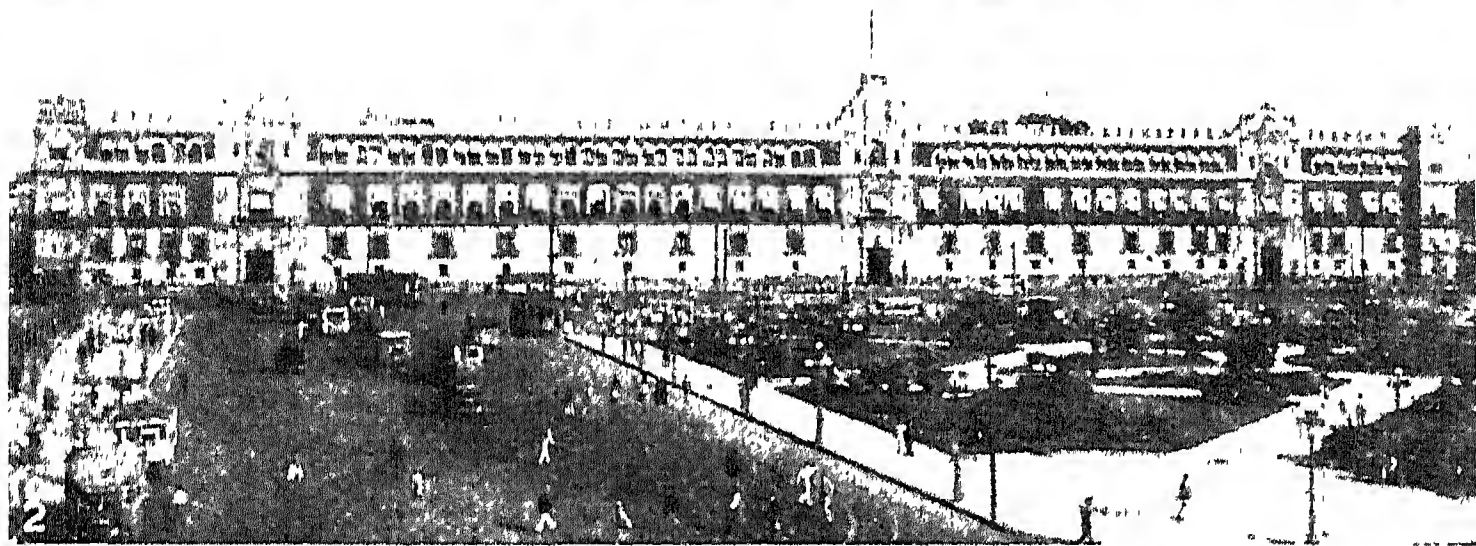
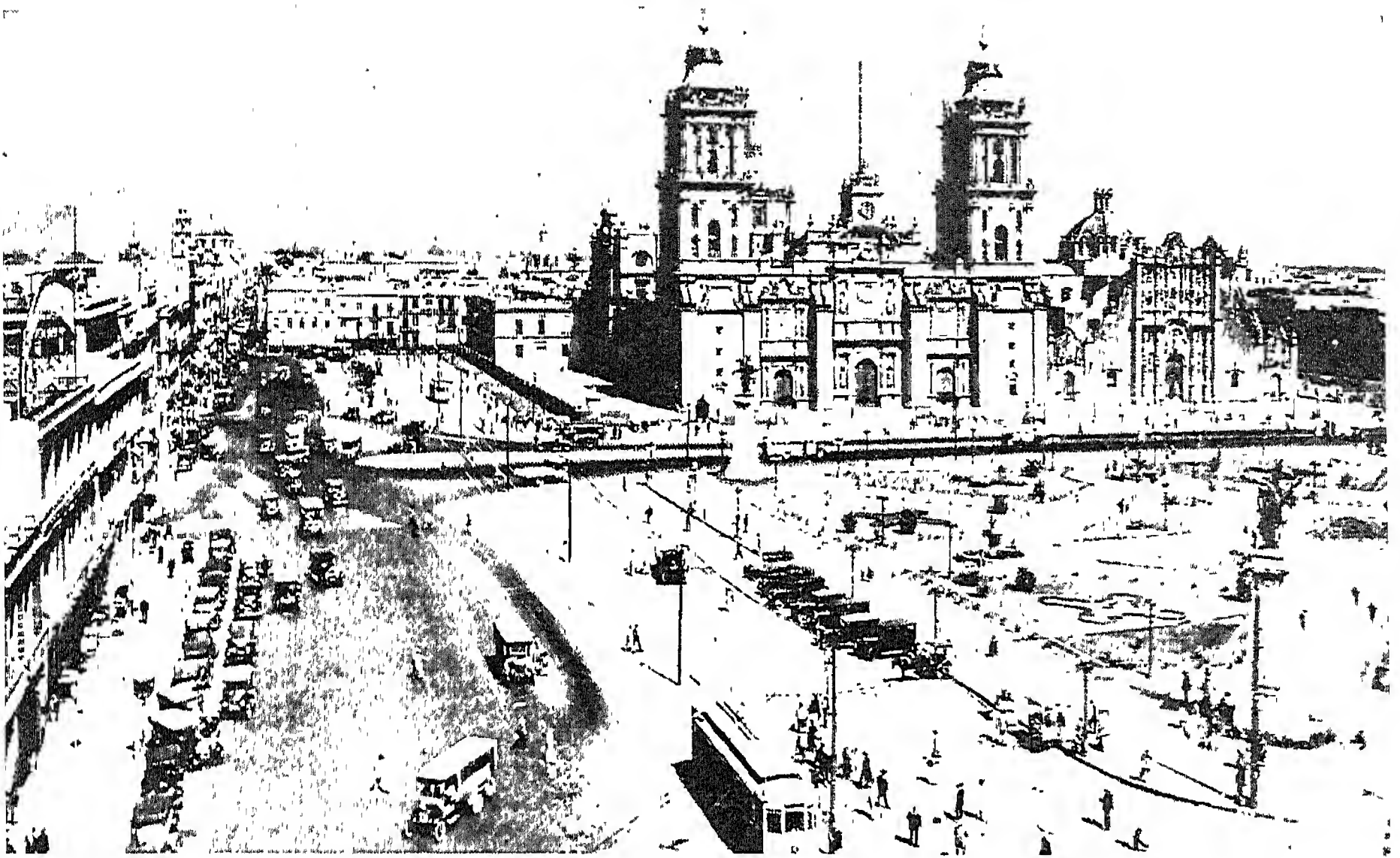
Meyer, LUKAS (1846-1902). Boer soldier. A native of the Orange Free State, he afterwards settled in the Transvaal and in 1884 helped to found the republic of Zululand, of which he became president. When this state was united with the Transvaal, he



Lukas Meyer,
Boer soldier

was chosen a member, and later president, of the Volksraad. He held a command in the S. African War of 1899-1902, taking part in the siege of Ladysmith. Meyer died in Brussels, Aug. 8, 1902.

Meyer, MARIE PAUL HYACINTH (1840-1917). French scholar. Born in Paris, Jan. 17, 1840, he became in 1876 professor of languages and literature of southern Europe in the Collège de France, and in 1882 director of the Paris École des



1. Plaza de la Constitución showing the cathedral, founded in 1573, and the adjoining Sagrario Metropolitano: on left, the Calle Monte de Piedad. 2. National Palace, the seat of government. 3. The National Theatre. 4. La Patria monument on the terrace in front of Chapultepec Castle. The seated female figure

represents the Republic sorrowing for her slain sons; four figures round the shaft typify inhabitants of the Mexican valley in past ages. 5. Column and statue of Independence, erected in 1890. 6. Chapultepec Castle, home of the President. 7. Sacrificial altar of King Tizoc, one of Mexico's rarest treasures, in the National Museum

MEXICO: BUILDINGS AND MEMORIALS IN THE CAPITAL CITY OF MEXICO

Chartes. At first Meyer's studies were limited to ancient Provençal literature, but soon extended to all the Romance languages. With Gaston Paris (*q.v.*) he founded the journal *Romania*, devoted to the interests of Romance philology. He died Sept. 8, 1917.

Meyer, VICTOR (1848-97). A German chemist, born in Berlin, Sept. 8, 1848. Educated at Berlin and Heidelberg, he became professor of chemistry at Zürich polytechnic, 1872, and succeeded Bunsen in the chair of chemistry at Heidelberg, 1889. He introduced new methods of determining the vapour densities of substances vaporising at high temperatures, and discovered the chemical bodies called aldoximes and ketoximes. While investigating the impurities in benzol he discovered thiophen and afterwards produced derivatives. He died Aug. 8, 1897.

Meyerbeer, JAKOB. Name used by Jakob Liebmann Beer (1791-1864), a German composer.



Jakob Meyerbeer,
German composer

Born in Berlin, Sept. 5, 1791, the son of a Jewish banker, as a child he played the piano in public and then studied with Abt Vogler at Darmstadt. His powers improved until he became one of the most brilliant pianists of the day, but his mind had already turned to composition. He began with an oratorio, and in 1813 produced his first success, the opera *Alimelek*. To develop his talent he spent some years in Italy, and settled in Paris in 1831. His principal operas, *Robert the Devil*, *The Huguenots*, and *The Prophet*, all effective dramatically, are no longer highly valued musically. He died May 2, 1864. *Pron.* myer-bare.

Meyerhof, OTTO FRITZ (1884-1951). A German biologist. Born March 12, 1884, at Hanover, he was educated at Heidelberg and Berlin, lectured at Kiel, 1913-24, and spent 1924-29 at the Kaiser Wilhelm institute of biology. He returned to Heidelberg as professor and director of the Kaiser Wilhelm institute of physiology, but in 1938, as a "non-Aryan," had to leave Nazi Germany. After working in Paris he became in 1940 research professor of bio-chemistry at the university of Pennsylvania. His discoveries concerned the thermic, respiratory, and energy

transformations in active muscles, and the laws of alcoholic fermentation, culminating in what was called the Pasteur-Meyerhof reaction. In 1922 he shared the Nobel prize for medicine; and in 1937 became a foreign member of the Royal Society. He died at Philadelphia, on Oct. 6, 1951. His publications included a work on chemical activity in the muscle 1930.

Meynell. An English hunt. Its district is in Derbyshire and Staffordshire. Sudbury is about the centre, while Burton-on-Trent, Tutbury, and Uttoxeter are in the area. The hounds belong to the members. The hunt began as a private pack, owned by Hugo C. Meynell Ingram, and named from his residence the Hoar Cross. He hunted the country during 1816-67, and in 1872 the pack ceased to be private property. New kennels were built at Sudbury, and the pack took its present name. *Consult* History of the Meynell Hounds and Country, J. L. Randall, 1901. *Pron.* mennel.

Meynell, ALICE CHRISTIANA GERTRUDE (1847-1922). British poet and essayist. Born at Barnes Sept. 22, 1847, she was the younger sister of Lady Butler, the battle painter. She was educated partly in Italy and grew up among literary acquaintance. She married Wilfrid Meynell

in 1877 and engaged with him in what Meredith called "princely journalism." To outward observers her life seemed complete with three interests: a strong R.C. faith (to which both she and her husband were converts), a sensitive, critical study of literature, and her large family. *Poems*, 1893, made a great success: such pieces as the sonnet *Renouncement*, *The Shepherdess*, *At Night*, *Christ in the Universe*, have entered many anthologies. Volumes of essays gained her recognition as a firm and independent critic. All her work shows a mind receptive to the spiritual meaning of life, and she was greatly revered by Francis Thompson, Coventry Patmore, and other writers who were her friends. She died Nov. 27, 1922. Last *Poems* appeared in 1923, and a centenary collection of prose and verse in 1947.

Meynell, WILFRID (1852-1948). British writer, born Nov. 17, 1852,

at Newcastle-on-Tyne, of Yorkshire parentage. He married Alice



Wilfrid Meynell,
British author

Christiana Gertrude Thompson in 1877, and shared with her in such journalistic enterprises as the *Weekly Register*. In *Journals and Journalism*, 1880, he proclaimed an ideal which he consistently followed. His study of Disraeli, 1903, was called an unconventional biography. *Verses and Reverses*, 1912, gives a picture of Meynell himself. In 1943 he was created C.B.E. He died Oct. 20, 1948.

Of the eight children of Wilfrid and Alice Meynell, Viola (d. 1956), who contributed the article on Poetry to this encyclopedia, was a novelist and literary critic. Her books include *Kissing the Rod*, 1937; *Alice Meynell*, new ed., 1947; *Francis Thompson and Wilfrid Meynell*, 1952; *Collected Stories*, 1957. Their youngest child, Francis Wilfrid Meredith (b. 1891), publisher, poet, expert and writer on typography, was knighted in 1946 for unpaid services to the board of trade. He founded the Nonesuch Press in 1923.

Mezen. River and port of the R.S.F.S.R. The river, rising in Komi A.S.S.R., flows N.W. through Archangel region to enter the White Sea by an estuary. Length about 500 m. The district it drains supports fishermen, breeders of cattle and reindeer, and a lumbering industry. Mezen port stands at the head of the estuary, 65 m. N.E. of Archangel, and exports timber.

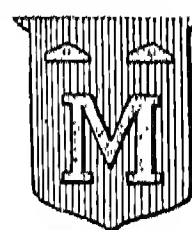
Mézières. Town of France, capital of the dept. of the Ardennes. It stands on both banks of the Meuse, 47 m. N.E. of Reims, close to Charleville. An old fortress, Mézières is also an important rly. centre, and makes hardware. It was captured by the Prussians in 1815 and 1871, and in the First Great War the Germans took it in Aug., 1914, and established a headquarters here. An



Sir Francis Meynell
British publisher



Alice Meynell,
British poet



Mézières
arms



Mezquit. 1. Branch with foliage and pods. 2. Flower spikes

objective of the Franco-American offensive in the last days of the war, it was reached by the French Nov. 8, 1918, the Germans before they left blowing up mines all over the town, and afterwards bombarding it for 24 hours. Over 700 houses out of 1,000 were destroyed. Pop. (1954) 11,073.

Mezötur. Town of Hungary. Situated on the Körös, 90 m. by rly. S.E. of Budapest, in the region of Szolnok, it is a typical market town of the Alföld, with a municipal area of 160 sq. m.; it trades in wheat, wine, horses, and cattle, and manufactures pottery. Pop. (est.) 30,000.

Mezquit OR MESQUITE (*Prosopis*). Genus of trees of the family Leguminosae. Natives of Southern, Central, and Western America, they have sweet twisted pods much used for cattle food. The leaves are twice divided into numerous leaflets. The branches are often armed with spines, and the small green or yellow flowers are clustered in heads or spikes. *P. glandulosa*, in addition to its hard, durable timber, yields a gum like gum-arabic.

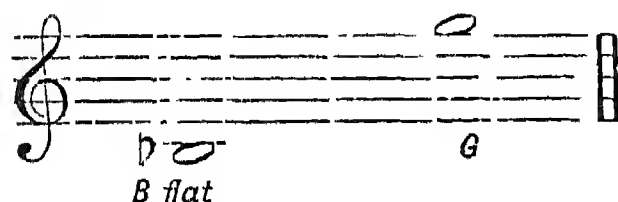
Mezzofanti, GIUSEPPE GASPARD (1774-1849). Italian cardinal and linguist. The son of a



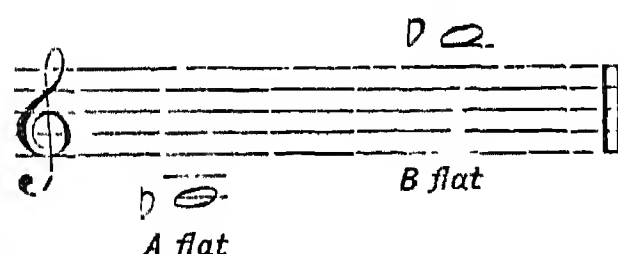
carpenter, he was born at Bologna, Sept. 17, 1774, and in 1797 was ordained priest and appointed professor of Arabic at Bologna, but he refused the oath to the Cisalpine republic. He became professor of Oriental languages, 1803, and librarian, 1815, of Bologna university; keeper of the Vatican library, 1833; and a cardinal in 1838. He died

March 14, 1849. Mezzofanti easily surpasses all other linguists on record. Acquainted with 114 languages and dialects, he spoke at least half that number fluently, composed verses in many, and had a sound knowledge of the chief literatures. *Consult* Life, C. W. Russell, 1858.

Mezzo-Soprano. A woman's voice of medium pitch. It possesses something of the full and sympathetic quality of the contralto, but with extended upward range. Its ordinary compass is about:



while exceptional voices will cover about:



See Contralto; Soprano.

Mezzotint. A process of engraving. A copper or steel plate is taken and the "ground" made thereon by means of a "cradle" or rocking tool, which raises a burr all over. This, if inked and printed, would give a uniform black. To obtain the picture, the highlights are scraped away by a scraper, and then burnished with a burnisher; the middle lights being treated in the same way, though less drastically, and the darkest shadows left intact. In mezzotint, therefore, the process is from dark to light, this being the opposite to other kinds of engraving.

The invention of mezzotint is ascribed to Ludwig von Siegen, an officer in the forces of William VI, landgrave of Hesse; he was the author of an extant mezzotint portrait of Amelia Elizabeth of Hesse, 1642. He communicated his discovery to Prince Rupert, whom he met at Brussels, and the latter introduced the process into England in 1660, and practised it himself with some success. Evelyn's *Sculptura* (1662) credited Rupert with the actual invention, and for nearly two centuries the error remained uncorrected in Great Britain. During the 17th century, Blooteling and other Dutch engravers in London developed the process, the elder John Smith and Richard Earlom continued to popularise it, and in Great Britain it reached the zenith of perfection towards the end of

the 18th century. On the Continent it never really took root.

In England, the decline of painting during the reign of Anne and George I acted as a discouragement to mezzotint, but the latter became again an art of first-class importance with the rise to fame of Reynolds, Gainsborough, Romney, and other English masters, whose manner lent itself specially to reproduction in this medium. James McArdell, J. R. Smith, Valentine Green, S. W. Reynolds, John Jones, and Charles Turner were among the first mezzotinters of this time. The later introduction of steel-faced plates hastened the abandonment of pure mezzotint for a mixed style of mezzotint and line and stipple engraving. Samuel Cousins was one of the best exponents of the mixed method. See Engraving.

Mho. Unit of electrical conductance. It is equivalent to the reciprocal ohm, hence the spelling. Thus the conductance of a conductor in mhos will be given by the ratio of the current flowing in amperes divided by the potential difference between the ends of the conductor expressed in volts.

Mhow Cantonment. Military station of Madhya Union, India, 13 m. S.W. of Indore town overlooking the r. Gumber near the Vindhya Hills. Pop. (1951) 44,655.

Miall, EDWARD (1809-81). British politician. Born at Portsmouth, May 8, 1809, he became an Independent minister. In 1840 he gave up his charge to begin a campaign against the establishment of the Church. Next year he founded a weekly newspaper, *The Non-conformist*, which he edited until his death, at Sevenoaks, April 29, 1881. He represented Rochdale in parliament 1852-67, and Bradford, 1868-74. See Disestablishment; *consult* Life, A. Miall, 1884.

Miami OR GREAT MIAMI. River of Ohio, U.S.A. Rising by several headstreams in the W. of the state, it flows about 140 m., generally S.S.W. The Little Miami, which follows a parallel course, enters the Ohio 5 m. above Cincinnati.

Miami. City of Dade co., Florida, U.S.A., on N. bank of the Miami river. In the centre of fruit-farming country, it is the S. terminus of the Florida E. coast rly. A govt. sub-tropical laboratory is here, and there are sponge fisheries. Miami and its dependent resorts cover 90 sq. m.; approximately 2,000,000 visitors are received during the winter season. Its prosperity varies enormously according to national business conditions:

building permits sank to a value of \$2,500,000 in 1932, but rose to \$25,000,000 four years later. The university of Miami emphasises the study of pan-American relations. Pop. (1950) 249,276.

Miami Beach. City of Florida, U.S.A., in Dade co. Miami Beach is situated on an island in Biscayne Bay 3 m. E. of Miami, and is connected with Miami (*v.s.*) by three causeways. Built on mangrove swampland and sand, it is, like its neighbours, noted for garish hotels, lavish private residences, and recreational facilities.

Miami Beach was incorporated as a town in 1915 and became a city in 1917. Land values boomed here in 1924-25, when people paid as much as 25,000 dollars for sites that were in fact swamp. Prices collapsed after the hurricane of 1926. Pop. (1950) 46,282.

Miaskovsky, NICOLAI YOKOV-LEVICH (1881-1950). Russian composer. Son of a military engineer, he was born at Novogeorgievsk, near Warsaw, April 20, 1881, and adopted a military career. In 1907 he resigned his commission to devote himself to music. At St. Petersburg conservatoire he studied under Rimsky-Korsakov and Liadov. His works include 27 symphonies, two symphonic poems, *Silence* and *Alastor*, an oratorio, *Kirov is with Us*, nine string quartets, and songs; they show the influence of Moussorgsky and Borodin. One of the well-known composers censured by Zhdanov early in 1948 for "formalism," he was in 1949 awarded a Stalin prize for a new 'cello sonata. He died Aug. 9, 1950.

Mica. A group of minerals characterised by hexagonal symmetry and a perfect basal cleavage. The micas can be split into thin flakes which are flexible and elastic. Chemically they consist of hydrous silicate of aluminium and potassium, with varying proportions of iron, magnesium, sodium, and lithium; some varieties contain chromium and titanium. The principal micas are muscovite (potash-bearing), biotite (potash-iron), phlogopite (magnesia-rich), lepidolite (lithia-mica) and lepidomelane (iron-rich). Colour varies from white muscovite to black lepidomelane; biotite is brown and lepidolite is frequently purplish. Muscovite and biotite are widespread in acid igneous and metamorphic rocks. Most of the micas are mined in India and the U.S.A. Muscovite and phlogopite are extensively used on account of their low electrical conductivity. They



Mr. Wilkins Micawber, the grandiloquent optimist described in *David Copperfield*. From a drawing by Fred Barnard

have low thermal conductivity and are used in furnace windows and as chimneys for oil or gas lamps. Powdered mica is used as a dusting medium in the building and rubber industries; in paints and wall-papers; as a lubricant and a filter. Powdered biotite is employed as a filler coating or medium in the roofing, rubber, and other trades.

Micah. One of the minor prophets. A native of Moresheth near Gath, and a younger contemporary of Isaiah, he prophesied in the reigns of Jotham, Ahaz, and Hezekiah. Of his prophecies the earlier chapters denounce oppression and drunkenness, and predict the ruin of the nations. Then follow Messianic predictions of restoration and future glory. The closing chapters deal extensively with the controversy between God and His people.

Mica Schist. In geology, name given to a metamorphic rock having a schistose or foliated structure, and composed chiefly of mica and quartz, arranged in alternate irregular bands. The rock cleaves easily along the mica bands, the latter usually being the colourless muscovite, or biotite varieties of mica. Garnet, tourmaline, etc., frequently occur in the rock, which is widely scattered, being found in the Scottish Highlands, N. America, as well as in many other parts of Europe.

Micawber, WILKINS. Character in Dickens's novel *David Copperfield*, often cited as the arch-type of incorrigible optimist, always grandiloquently confident, even in his moments of shabbiest poverty,

that "something will turn up." For the superficial mannerisms of the character, his airy assumption of gentility, his rotund phrases and prolific letter-writing, and his persistent geniality, the novelist took as model his father John Dickens. Sir Herbert Tree appeared as Micawber (doubling the part with that of Peggotty) in Louis N. Parker's stage version of *David Copperfield*, 1914, and W. C. Fields gave a memorable interpretation of the character in the Hollywood film version, 1935.

Michael (Heb., Who is like God?). One of the angels in the books of Daniel and Revelation. In Dan. 12, v. 1, he is described as the great prince which standeth for the people (*cf.* chap. 10, vv. 13, 21). He is thus the champion of the Israelites against the prince-angels of the Persians and the Greeks. In Rev. 12, v. 7, which speaks of there being war in heaven, he is the victorious leader of the good angels (the Archangel) against the Dragon (the old serpent, he that is called the Devil and Satan) and his angels. See Archangel; Michaelmas.

Michael. Name of nine East Roman (Byzantine) emperors, of whom the more notable included: Michael I (d. 845) who became emperor in 811. He was defeated by Leo the Armenian and forced to yield the throne to the usurper in 813, retiring to a monastery. Michael II (d. 829) called the Stammerer, ascended the throne in 820. During his reign the Saracens captured Crete and Sicily. Michael IV (d. 1041), called the Paphlagonian, was raised to the throne by his mistress, the empress Zoë, daughter of Constantine VIII, who is reputed to have poisoned her husband in order to marry him. Michael VIII, Palaeologus (1234-82), was proclaimed joint emperor of Nicaea with John Lascaris in 1260. After he captured Constantinople in 1261, he caused Lascaris to be blinded and dethroned, for which crime he was excommunicated by Arsenius. He attempted to bring about a union of the eastern and western churches. Michael IX (d. 1320), son of Andronicus II, shared the throne with his father, but died before him.

Michael (1596-1645). First Romanov tsar of Russia. Son of Feodore Nekitich Romanov, he was born June 21, 1596, and was chosen emperor of Russia by a national assembly in 1613. He left the government mainly in the hands of his ministers. The first ruler of the Romanov dynasty, he died at Moscow, July 23, 1645.

Michael (b. 1921). King of Rumania. The son of King Carol II and Princess Helena of Greece, he



Michael,
King of Rumania

was born at Pelesch, Oct. 25, 1921. When his grandfather, King Ferdinand, died on July 20, 1927, he was declared king, as his father, Prince Carol, was in voluntary exile. In 1930 Carol returned to Rumania and supplanted his son. A coup organized by the fascist Iron Guard brought about on Sept. 6, 1940, Michael's second accession to the throne, the real ruler being Gen. Antonescu (*q.v.*), who in turn was subject to German control.

On Aug. 23, 1944, Michael announced the termination of Antonescu's dictatorship and his acceptance of Russian armistice terms. War was declared on Germany. Next year, Marshal Tolbukhin invested Michael with the Soviet Order of Victory. After the war the king attempted to broaden his government, but the Communists made his position difficult. After visiting London to attend the wedding of Elizabeth (II) in 1947, he returned to Bukarest and on Dec. 30 abdicated, his engagement to Anne of Bourbon-Parma being unacceptable to the government. Michael with his mother left the country, the royal family being deprived of Rumanian nationality and property. Michael married Anne at Athens, 1948; they settled in England, 1952.

Michael (b. 1942). A British prince. Third and youngest child of George, duke of Kent, and Princess Marina, he was born July 4, 1942, and christened Michael George Charles Franklin, the last name given in honour of President Roosevelt, one of his godfathers.

Michael (1558-1601). Voivode (governor) of Wallachia, called the brave. Member of the noble family of the Bassaraba, Michael was banished by the voivode Alexander, but deposed him in 1593. He drove the Turks from Wallachia and having come to an understanding with the emperor Rudolf and with the Turks, succeeded in uniting, under his rule, nearly the whole Ruman people, 1599-1600 assuming in 1600 the title of voivode of Wallachia and Moldavia, and governor of Transylvania. Threatened by a rising of the Transylvanians, under Sigis-

mund Bathory, aided by Poland, he obtained support from the Imperial government, and defeated Bathory, but a few days later Aug. 19, 1601, was murdered at the instigation of the imperial general Basta.

Michael Alexandrovitch (1878-1919?). Russian grand duke. Born in St. Petersburg, Nov. 22, 1878, he was a brother of Nicholas II. His marriage, in Oct., 1911, was morganatic, and in the following Jan. an imperial manifesto relieved him of the duties of regent imposed upon him in Aug., 1904, in the event of the death of the emperor before the attaining of his majority by the heir apparent. In the First Great War he commanded a division of Caucasian cavalry in Galicia. At the revolution of March 1917, Nicholas II abdicated in favour of the Grand Duke Michael who was arrested by the Bolsheviks after their accession to power and exiled to Perm, where he was later assassinated. See Nicholas II; Russia.

Michaelis, KAREN (1872-1950). Danish author. Born at Randers, March 20, 1872, of a family named Beck Brøndum, she married the poet Sophus Michaelis in 1905, and gave up a musical training for literature. She published novels which were translated into several languages. Her work was marked by considerable power of description and a broad outlook on feminine questions. The publication of *The Dangerous Age*, 1910, established her reputation as a European novelist. Later volumes included *Hjertets Vagabond*, 1930; and *Mor* (Mother). She also wrote books for children, of which *Bibi* (6 vols.) was popular. She died in Copenhagen, Jan. 11, 1950.

Michaelmas. Feast of S. Michael and All Angels, Sept. 29. It was instituted in 487. In England it is a quarter day. In the United Kingdom magistrates are usually appointed at or about Michaelmas. Until 1873 the first term of the legal year was Michaelmas term, Nov. 2-25. The custom of eating goose on Michaelmas Day may have originated in the rural tenant's custom of propitiating his lord with a present of a goose at Michaelmas, when the bird is in fine condition, and also perhaps in the lord's distributing his superfluous geese among his friends.

Michaelmas Daisy. Popular name for hardy perennial herb more properly termed aster (*q.v.*).

Michel, CLÉMENTCE LOUISE (1833-1905). French anarchist and author. Born in the Château Vroncourt, Haute-Marne, April 20,

1833, she went to Paris in 1856. Intensely anti-Napoleonic, she joined the Communists, and fought at the Paris barricades but was taken prisoner and transported to New Caledonia. After release, under the amnesty of 1880, she returned to Paris. For taking part in anarchist rioting in 1883 she was sentenced to six years' imprisonment, but was released in 1886, and came to London. In the same year she published the first volume of *Mémoires par Elle-Même* (never completed), and *Les Microbes Humains*. These were followed by *Le Monde Nouveau*, 1888. She returned to Paris in 1895, published her work *La Commune*, 1898, and died at Marseilles, Jan. 9, 1905.



Louise Michel,
French anarchist

Michelangelo. Name commonly used for the Italian artist Michelagnolo (or Michelangiolo) di Lodovico Buonarroti-Simoni (1475-1564). Born March 6, 1475, at Caprese, he was the 2nd son of Lodovico Buonarroti who returned next year to the ancient home of his family, the Buonarroti, in the village of Settignano, overlooking Florence, and there, his foster-mother a stonemason's wife, the child grew up among the stone-carvers. Mallet, chisel, and marble were the toys of his childhood. Packed off to school in Florence to rid him of vulgar artistic tastes, he could not be kept from the society of art students; and at 13, on April 1, 1488, he was apprenticed by his disgusted father to the painter Ghirlandaio, from whom he soon drew the famous plaint, "This boy knows more than I do."

Catching the eye of Lorenzo "the Magnificent" with his first sculpture, the lad was forthwith given rooms in the palace, where he was treated like a son. Living amongst the most famous of the age, the young fellow was soon a prey to his hopeless passion for the beautiful Luigia de' Medici. It was about this time that one of his fellow-pupils savagely struck and broke his nose. On April 8, 1492, his beloved friend and patron Lorenzo de' Medici died; and Michelangelo's boy-companion, the worthless Piero de' Medici, reigned in his stead. Michelangelo left for Venice. Unable to get work, he wandered to Bologna, where a gentleman, one Aldovrandi, befriended the penniless youth.

Michelangelo had now to leave Bologna owing to the threats of the jealous craftsmen of the town; so in the springtime of 1495 he returned to Florence to find the beautiful Luigia dead and a republic established. Though but twenty, he was made a member of the general council of citizens. Called to Rome by a cardinal who had bought his Sleeping Cupid as an antique, the young sculptor hurried eagerly to ride to the goal of his ambitions in the June of 1496; he was soon at work on the superb group of his Pictà. Unfortunately the money difficulties of his father and family kept the young artist poor in order to send them constant relief: nevertheless, when at 26, in the spring of 1501, he again entered Florence,



Michelangelo Buonarroti

Portrait in the Capitoline Gallery, Rome

he was hailed as the first sculptor of his age. Finding a large discarded block of marble, he wrought out of it his mighty masterpiece the colossal David.

Summoned to Rome by Pope Julius II in 1505, the young artist eagerly set forth on his second journey thereto. The great Pope Julius II, an extraordinary man, ordered a magnificent monument to himself. Michelangelo's design being too huge to set in S. Peter's church, the pope decided to have the church rebuilt by Bramante on a vast scale. Tricked by the pope over money, Michelangelo took horse in a rage for Florence. "Forgiven" and recalled by the pope in 1508, he rode into Rome for the third time, his heart set on finishing the great sculptures for the Julian tomb, only to find that Bramante and Raphael and others, playing on the old pope's superstition, had maliciously suggested Michelangelo being set in-



Michelangelo. The Holy Family, an early work, painted in tempera, 1501-5
Uffizi Gallery, Florence

stead to painting the Sistine chapel. Thus it came about that Michelangelo, shutting himself up in the chapel alone, with the fresco dripping on his upturned face, cramped by the terrible fatigue, put himself to the stupendous task, and, four years afterwards, on Nov. 1, 1512, there was revealed to Rome the masterpiece of painting of the Italian Renaissance.

Pope Julius, feeling the end at hand, now ordered Michelangelo to finish the great Julian tomb. Julius, dying four months afterwards, was succeeded by Pope Leo X, a Medici, who ordered Michelangelo instead to Florence to the erection of his great Medicean tomb in honour of the Pope's two brothers lately dead.

Then came the sack of Rome in 1527. Florence shook off the yoke of the Medici, and, Michelangelo, now 52, flung himself into the war of liberty.

But the fall of the city through treachery saw Alessandro de' Medici enter in triumph and Michelangelo a fugitive. However, the anger of the Medicean pope soon cooled, and Michelangelo was torn this way and that by the jealousies rampant over the completion of the two great tombs. Finishing the masterpiece of the Tomb of Giuliano and Lorenzo de' Medici in 1534, he left Florence for ever.

On his reaching Rome for the fourth time, now on the edge of 60, the new pope, the crafty Paul III, compelled Michelangelo to the painting of the vast Last Judgment. It was now in his sixties that he met the second woman



Michelangelo. La Pietà: marble group representing the Madonna tending the body of the dead Christ. Executed in 1499, this is the only work ever signed by Michelangelo, whose name appears on the band crossing the breast of the Madonna

S. Peter's, Rome

who was so greatly to influence his life—Vittoria Colonna, the first woman of the age, the inconsolable widow of the Marquis of Pescara, was at forty-two to arouse a strange platonic passion in him.

In 1545, at 70, Michelangelo completed his much modified design of the huge Julian Tomb. The following year, Pope Paul III made him architect to complete the great church of S. Peter that Bramante had planned for Pope Julius II. On the morrow of his taking up the huge task, his romantic friendship with Vittoria Colonna ended with her death.

Family griefs fell fast, but his devotion to his kin bore rich fruit in his old age. Wealthy, frugal of habit, he poured forth vast designs. Sleeping little, working at night, a candle in his cap, at his sculpture, he lived in lonely communion with his own soul. But his vigorous old body could not resist the severe chill which took him to his armchair, where he died a little before five of the clock in the afternoon of Feb. 18, 1564. Michelangelo, with colossal gifts, uttered his age like the giant he was. He claimed to be a sculptor alone, yet as poet, painter, and architect he reached to vast repute—he signed his immortal paintings in the Sistine chapel as Michelangelo, sculptor. He stands forth rugged, stern, honest, uncompromising, virile, as the mighty seer of the Renaissance, like some ancient Hebrew prophet. Over all he wrought is a tragic gloom, for his stern eyes saw the failure of Italy to reach to the splendid realm of Liberty. Entertaining few friends and shunning the society so dear to Raphael, he wrought his solitary art with his own wondrous hands, scorning the courtier ways of Raphael, arrayed in magnificence, and working amidst his crowd of assistants. Michelangelo was the subject of a dramatic poem by Longfellow (1883). Seven of his sonnets were set to music by Benjamin Britten (1940). See Adam; Art; Farnese Palace; Isaiah; Jesus; Moses.

Bibliography. Life with trans. of many of his poems and letters, J. S. Harford, 1857; Life and Works, C. Heath Wilson, 1876; Lives, J. A. Symonds, 1899; A. Condivi, Eng. trans., C. Holroyd, 1911; C. Clement, 1930; Lord Finlayson, 1936; C. de Tolnay, 1946.

Michelet, JULES (1798-1874). French historian. Born in Paris, Aug. 21, 1798, he was educated at the Collège Charlemagne, and in 1830 became head of the historical section of the royal archives. At this period appeared the first

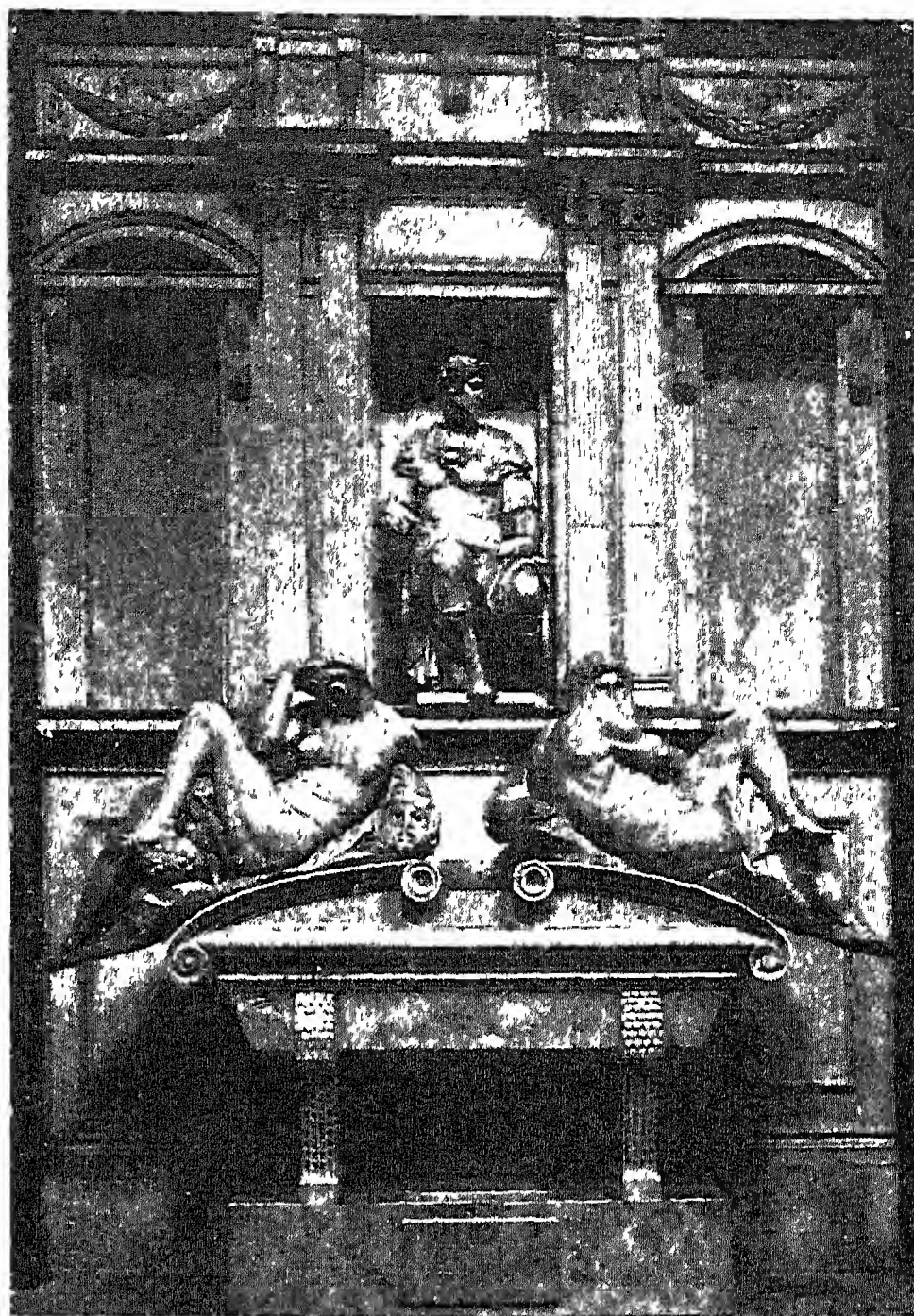
volume of his history of France (1837-67) which, with the History of the French Revolution (1847-53), gives him a high place among French historians. An ardent democrat, his lectures were prohibited in 1851, and from that time to his death on Feb. 9, 1874, he lived in retirement.

Michelson, ALBERT ABRAHAM (1852-1931). German-born American physicist. Born at Strelno, Prussia, Dec. 19, 1852, he emigrated to America and in 1873 graduated from the U.S. Navy academy, where he became instructor in physics and chemistry. Re-

signing from the navy in 1881, he was appointed professor of physics at the Case school of applied science, Cleveland, Ohio. In 1892 he became head of the physics department, Chicago university, where his researches enabled him to perfect methods for determining with precision the speed of light.

Michelson measured a metre in terms of the light wavelengths. In 1897 he was appointed a member of the international committee on weights and measures. He received the Nobel prize for physics in 1907; the first American to do so.

With Edward Morley (1838-1923) Michelson carried out a number of experiments, for which he is chiefly famous, designed to show the relative motion of matter and ether (see Ether, p. 3155). The negative results of these experiments became one of Einstein's chief starting points in the formulation of his theory of relativity (*q.v.*). Michelson's name is also associated with a type of optical interferometer. He published *Velocity of Light*, 1902; *Light Waves and Their Uses*, 1903; and *Studies in Optics*, 1927. He died May 9, 1931.



Michelangelo. Tomb of Giuliano de' Medici, who is represented as a general of the Church. On the sarcophagus are figures of Day and Night. The monument inspired Swinburne's sonnet, In San Lorenzo

Church of S. Lorenzo, Florence

Michigan. Lake of the U.S.A. The third largest of the five great lakes of North America. Entirely within the U.S.A., it is 320 m. long, has a mean breadth of 65 m., and covers an area of 22,400 sq. m. It lies 581 ft. above sea level, and its greatest depth is 860 ft. The lake, which has few large indentations apart from Green Bay and Grand Traverse Bay, has low, sandy shores, and navigation is rendered dangerous by heavy winds and the absence of good harbours. Communication with Lake Huron is provided by the Strait of Mackinac and with the Mississippi river by the Chicago Drainage Canal. The only islands are a group in the N., the largest of them being Manitou, 50 m. long, and the chief streams entering the lake are the Manistee, Muskegon, Menominee, and Fox. The trout, salmon, and other fisheries are important. Chicago, Milwaukee, Manistee, and Sheboygan are among the cities on the shores of the lake.

Michigan. Northern state of the U.S.A., known as the Peninsula State, from its division by Lake Michigan into two peninsulas. The N. peninsula is traversed by low

mountains, and is rich in minerals; the S. peninsula is hilly in the N. with a prairie expanse towards the S. Thousands of small lakes break the surface, while the Muskegon, Grand, Kalamazoo, and many other rivers supply much water-power for the various industries, but are often unnavigable. Maize, wheat, potatoes, hay, and sugar-beets are extensively cultivated, and iron and copper mined.

The iron ore is chiefly a rich red and brown haematite mostly obtained from the Marquette range in the N. peninsula, and the copper is chiefly drawn from Keweenaw Peninsula on Lake Superior; silver, salt, coal, Portland cement, building-stones, and glass sand are also worked. Rural districts and small towns are prosperous; the development of the Ford Motor co. at Detroit provides one of the most striking developments of modern industry in the U.S. It has 6,984 m. of rly. Michigan was admitted to the Union in 1837. Two senators and 18 representatives are returned to congress. One of its most prominent senators during and after the Second Great War was A. Vandenberg (*q.v.*). Lansing is the capital. Detroit the chief city. Area 58,216 sq. m. (1,194 sq. m. inland water). Pop. (1950) 6,371,766. *Consult* The Land of the Crooked Tree, U. P. Hedrick, 1949.

Michigan City. City of Indiana. U.S.A., in Laporte co. It is on Lake Michigan, 55 m. by rly. E.S.E. of Chicago, and is served by the Lake Erie and Western and other rlys., and by lake steamers. The seat of a Protestant Episcopal bishop, it contains the Northern Indiana state prison. It is mainly a summer resort, and its population increases by several thousands in the holiday months. Its main industries are fishing and the manufacture of metal products, including bicycles, and of clothing. Michigan city was organized in 1832, incorporated in 1837, chartered as a city in 1867. Pop. (1950) 28,395.

Michoacan. Maritime state of Mexico. Bordered S. by the Pacific, and covering an area of 22,874 sq. m., it is generally mountainous, the N. portion belonging to a great plateau, and the S. portion, which slopes away to the sea and the Mescala or Balsas river, consisting of a series of wooded mt. chains and productive valleys. It is watered by the rivers Lerma and Balsas and several smaller streams, and contains a number of large lakes, the principal being the Cuitzéo and Patzcuaro, and part of Chalapa. Cereals, sugar, coffee,

and tobacco are cultivated, and gold, silver, lead, iron, and coal are mined. There are good roads. The capital is Morelia. Pop. (1950) 1,422,717.

Mickey Mouse. Film cartoon character. Devised by Walt Disney (*q.v.*) while working on a series of film cartoons about Oswald the Rabbit, Mickey made his début in Steamboat Willie, 1928, the first film cartoon to be synchronized with sound, though Disney had already made two silent Mickey pictures. In 1929 Disney produced his first musical Mickey cartoon, The Opry House. The Chain Gang, 1930, introduced Mickey's dog Pluto. The first Mickey Mouse and Donald Duck (*q.v.*) colour cartoon, The Grand Concert, was produced in 1935. By Dec., 1947, Mickey had been the star of 188 short productions, and appeared in two full-length films: Fantasia, 1941, and Fun and Fancy Free, 1947.

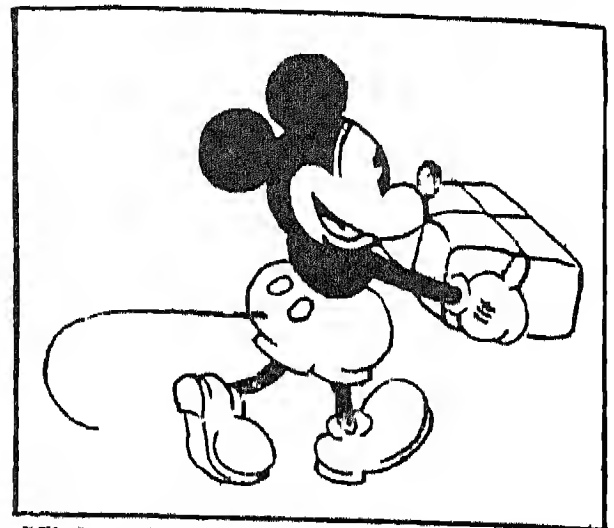
Mickiewicz, ADAM (1798-1855). Polish poet. He was born near Novogrodek, Lithuania, Dec. 24, 1798, and educated at the university of Vilna. In 1824 he was arrested as a political suspect, and banished to the interior of Russia. He formed a friendship with Push-



Adam Mickiewicz,
Polish poet

kin, and wrote a series of beautiful sonnets on the Crimea, which he visited in 1825. He composed several epics, including Dziady, 1823-27, Grażyna, 1827, and Konrad Wallenrod, 1828. Permitted in 1829 to travel abroad, Mickiewicz, after meeting Goethe at Weimar, went to Rome, where he wrote the epic Pan Tadeusz, his finest work, pub. 1834. He settled in Paris as professor of Slavonic literatures at the Collège de France, 1840, but was dismissed 1844 for political propaganda in his lectures. In 1848 he helped to organize the Polish legion in Italy. Sent by Napoleon III to Constantinople to form Polish regiments for the Crimean War, he died in that city, Nov. 26, 1855. *Consult* Life. M. M. Gardner, 1911. *Pron.* misk-yevich.

Micmacs (allies). North American Indian people of Algonquian stock. They were a confederacy of 7 tribes, inhabiting, at the discovery of America, what is now Nova Scotia and adjacent regions; three individuals were taken to



Mickey Mouse. Walt Disney's famous film character

England by Sebastian Cabot in 1497. They were the most primitive of the eastern Algonquins (*q.v.*) from whom their dialect differences indicate a fairly early separation. They number some 3,000.

Microamp. A unit of electrical current. It is equal to one-millionth of an ampere.

Microbar. Unit of pressure. It is equal to one dyne per sq. cm. The normal atmospheric pressure is 1.013×10^6 microbars.

Microclimate. Term applied to the modifications which are experienced in the general climate owing to the influence of local factors. Climatic variations may be considerable, even over distances of a few hundred yards, and can be caused by differences of soil or grass cover, the effects of vegetation, the emission of smoke from factory chimneys, the presence of land or sea breezes, etc. The climate of a city often differs markedly from that of the surrounding rural districts. Microclimatological investigations have come to the forefront in agriculture, where the actual meteorological conditions to which the growing plants and crops are subjected are recognized as being of vital importance. *See* Climate; Frost; Meteorology.

Microcline. A common mineral in the granitic rocks. It is a member of the feldspar group and has the same composition as orthoclase (*q.v.*), potassium aluminium silicate, but shows different crystal form, being triclinic. It occurs as white to pinkish grains and crystals in granites, pegmatites, and feldspathic sandstones. The bright green variety known as amazon stone is used in ornamental work and jewelry. In common with other feldspars microcline has uses in the ceramic industry. *See* Feldspar.

Microcosm (Gk. *mikros*, small; *kosmos*, world). Term applied by the mystics of the 17th century to man as the world in little, the spiritual mirror of the macrocosm,

the great world or universe. The movements of the life of the microcosm were supposed to correspond exactly with the movements of the life of the macrocosm. Microcosm is the title of a philosophical work by Lotze (*q.v.*). See Universe.

Microcosmic Salt. Hydrogen ammonium sodium phosphate, $\text{NH}_4\text{NaHPO}_4 \cdot 4\text{H}_2\text{O}$. Its composition was investigated by Marggraf, and subsequently by Proust. It was made originally from urine, but is now prepared by mixing hot strong solutions of ammonium chloride and sodium phosphate. It is a crystalline body which melts to form a glassy mass of sodium metaphosphate, and is much used in blowpipe work for dissolving metallic oxides.

Microfarad. The practical unit of electrical capacitance. It is equal to one-millionth of a farad.

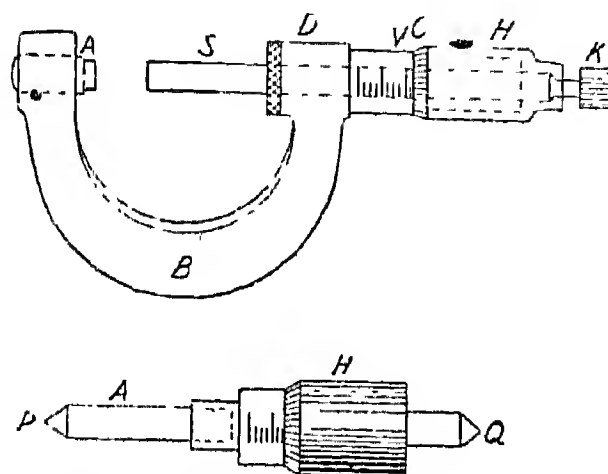
Microfilm Recording. Photographic process by which documents are copied on to continuous lengths of film up to 100 feet in length and either 16 mm. or 35 mm. in width. Automatic cameras employing electric or pneumatic mechanism are employed, a single movement switching the lights, opening and closing the shutter, and winding on the film ready for the next exposure. For certain classes of work, apparatus has been designed which can be operated by office staff with a minimum of training. The system is increasingly being used for the duplication of books, manuscripts, music, newspaper files, cheques, insurance policies, and business records of all kinds. It has brought about great economy of storage space, *e.g.* the contents of four large ledgers can be copied on to a roll of film contained in a can 4 ins. in diam. and less than 2 ins. deep. During the Second Great War many valuable and historical documents (including parish registers) were copied by this process, and the films sent abroad for safe keeping. The films, which are usually processed by the makers, may be projected for reading in special cabinets, or photographic enlargements may be made from them.

Microhm. Electrical term. It is one millionth of an ohm, and is the practical unit of resistance.

Micrometer (Gr. *mikros*, small; *metron*, measure). Engineering instrument. In modern engineering practice very fine limits of measurement are necessary in a number of cases, *e.g.* where cylindrical articles are finished to size by grinding. Such measurements are made to the nearest 0.001 in. and

sometimes to the nearest 0.001 in. An instrument for making such measurements is a micrometer.

A type of micrometer used for measuring external dimensions is illustrated. At one end of the body B is fitted the anvil A, which can be adjusted slightly for zero read-



Micrometer. Diagrams illustrating types used for measuring (top) external and (bottom) internal dimensions. For explanation of lettering, see text

ing. For measurements in inches the screw S has 20 threads per inch, so that one turn of S represents 0.05 in. The head H, which is attached to and moves with the screw, has its edge C equally divided into 50 divisions. Thus a movement of one division on the head represents a longitudinal movement of 0.001 in. of the screw. A vernier V on the nut D enables a movement of one-tenth of one of the divisions on C to be read, so that readings to 0.0001 in. can be taken. In order to avoid upsetting the reading by application of excessive pressure the head is turned by the knurled extension K, which is arranged to slip when a pre-determined light pressure is exceeded.

The length of the scale on D rarely exceeds 1 in. and is frequently less. Any size of gap can be used, however, provided that a standard block of certified length is used for setting the micrometer. In this case the screw is set to zero and A is adjusted to fit the block. For internal measurements the distance PQ is adjusted by a similar micrometer screw and head H. Different lengths of A can be used according to requirements, the zero being checked with an external micrometer.

Another form of micrometer, generally used for checking variations in size, consists essentially of a flexible diaphragm enclosing a quantity of coloured fluid which communicates with a capillary tube. The size of the tube is chosen so that a movement of 0.001 in. of the diaphragm produces a rise of 1 in. in the capillary tube, so that variations as small as 0.0001 in. are easily detected.

Micron. Unit of length equal to 10^{-6} metre or 10^4 angstrom. The wavelengths of the yellow lines of the sodium spectrum are 0.5890 and 0.5896 micron.

Micronesia (Gr. *mikros*, small; *nēsos*, island). Collective name of several groups of small islands in the Pacific Ocean. They are situated between the equator and lat. 20° N. and long. 130° to 180° E. The chief are Marianne, Caroline, Marshall, Gilbert, and Pelew Archipelagos, all separately described. Politically they were apportioned among Great Britain, the U.S.A., and Germany, but after the First Great War Germany's possessions came under mandate to Japan.

Micronesian. Term denoting the inhabitants of the diminutive islands N. of Melanesia in the W. Pacific. Micronesians are slenderer, shorter, darker, hairier, and longer-headed than the Polynesians. They are the product of fusion of many peoples. Melanesian influence is most marked in the Marshall Islands, Malay in the W. Carolines, Japanese in the Marianes, Polynesian in the E. Continental Asiatic influence is suggested by ancient stone ruins, such as the city of Metalinin on Ponape. Local forms of dress and equipment, the semi-divine status of the chiefs, and the veneration of stone pillars, sometimes stone-circled, suggest Polynesian influence.

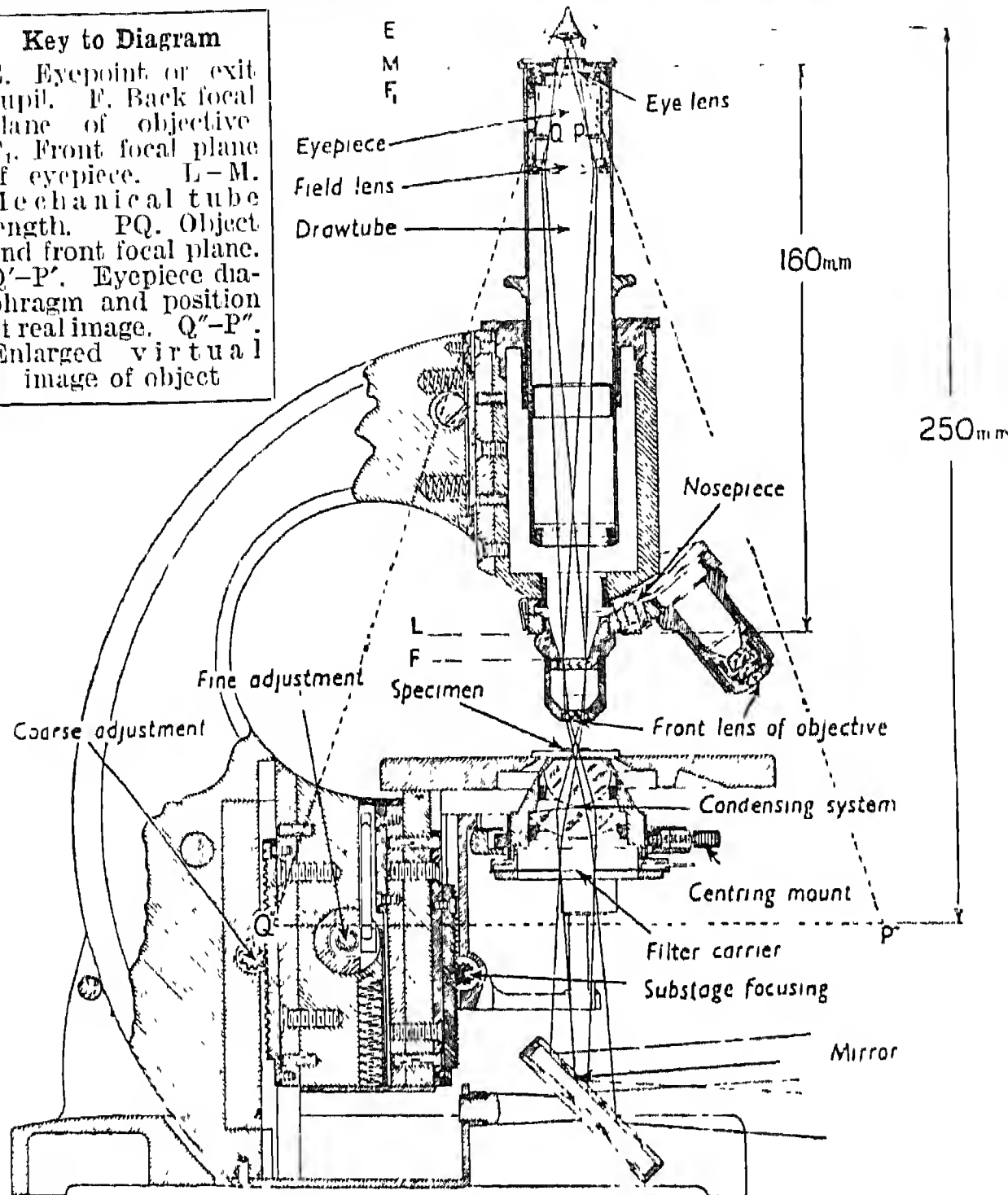
Microphone. An instrument for the conversion of sound energy into electrical energy. The original instruments were termed transmitters, such as in the original Bell system of telephony where an iron diaphragm placed in the field of a magnet caused currents to flow in the coils surrounding the magnet when sound waves vibrated the diaphragm. These electric currents were then conveyed by wires to the receiver, or ear-piece, which was of similar construction. The fluctuations caused variations in the strength of the magnet and these variations vibrated the diaphragm so that it generated sound waves similar to the originals.

This simple transmitter, or microphone, was useful only over short distances as it operated only with its own weak generation of electrical energy.

Professor Hughes began investigations in 1878 in the use of the carbon microphone, which acts fundamentally as a relay for controlling an existing source of electrical energy. The vibrating diaphragm, made of iron alloy, in contact with carbon granules packed into a small cavity, causes

Key to Diagram

E. Eyepoint or exit pupil. F. Back focal plane of objective. F₁. Front focal plane of eyepiece. L-M. Mechanical tube length. PQ. Object and front focal plane. Q'-P'. Eyepiece diaphragm and position of real image. Q''-P''. Enlarged virtual image of object



Microscope. Tracing the path of rays through a modern microscope fitted with below stage controls, and for binocular or monocular use

Courtesy of G. Baker

the granules to vary their contact resistance to an electric current passing through them. The circuit comprises a battery, microphone, transmission line, and the ear-piece, the latter being of a magnetic type. Such forms of microphone are still used in Post Office telephones but with great improvements in detail. They are not, however, suitable for the transmission of wide bands of frequencies, such as are needed for converting complex musical sounds into electric currents.

Moving coil microphones can give excellent quality transmission. A very light and freely suspended diaphragm has a coil fitted to its centre; this coil is positioned in a circular gap between the pole-pieces of a powerful permanent magnet. Sound waves vibrating the diaphragm cause the coil to cut the magnetic lines of force in the gap so that currents are generated in the coil and these may be fed to amplifiers for magnification. Other forms of microphones employ very light ribbons of aluminium which act both as a diaphragm and the conductor in which the current is generated, while a further type

employs piezo-electric crystals which generate a voltage across their faces when subject to varying mechanical pressure.

Microphotography. The process of photographing books, documents, etc., page by page on small-sized film, in order to provide records or duplicates at low cost and in a compact form. It is sometimes confused with photomicrography (*q.v.*).

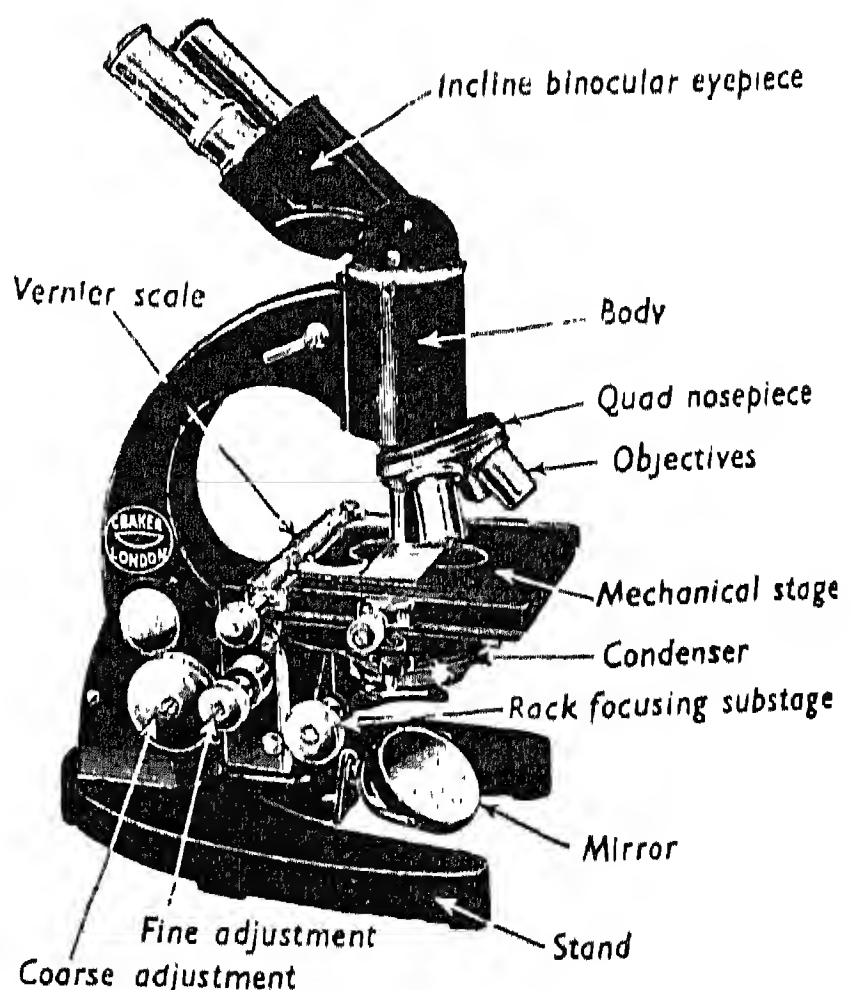
Micropyle. Small aperture left in the integument of an ovule which facilitates the approximation of the male gamete to the female. In gymnosperms the drying of a drop of liquid secreted for that purpose draws the pollen grain into the micropyle; in angiosperms the pollen tube grows into it.

Microscope (Gr. *mikros*, small; *skopein*, to look at). Optical instrument for the ex-

amination and magnification of small objects. In its simplest form, that of a single lens (*q.v.*), it is very ancient, for the phenomenon of magnification by a curved transparent disk of material must have been noticed in the earliest times. But the high-powered compound microscope is a comparatively modern invention.

Early observers found that the single lens gave a coloured and distorted image, and it was not until the invention of the achromatic lens (*q.v.*) by Chester Moor Hall, 1729, and John Dollond, 1752, that any great advance was made in the use of the instrument. The theoretical researches during 1873-81 of Professor E. Abbe, combined with the practical skill of the German glass-maker Dr. Schott, brought about an enormous increase in the powers of the microscope and laid the foundation of modern microscopy. Sir Almroth Wright and J. J. Lister, the father of Lord Lister, also carried out researches that did much to discover the principles of the modern scientific microscope.

The simplest form of microscope consists of a magnifying lens at one end of a tube and another lens at the other end, serving as an eyepiece. All modern microscopes are constructed on this principle, the two simple lenses being replaced by two complicated systems of lenses. The system nearest the object being examined is called the objective, and that nearest the eye, the eyepiece. The objective is the more important part, and may consist of a large number of lenses



Microscope. An inclined binocular tube microscope, showing the main components

Courtesy of G. Baker

of varying powers and properties according to the type of microscopic work being undertaken. Its function is to collect the rays of light from the object and bring them to the focal image.

The strain on one eye of examining objects with a microscope is very great, and in 1860 F. H. Wenham designed a binocular microscope with two tubes and two eyepieces, which has considerably lessened the strain of the work. The light rays from the objective are split up by a prism, and the two images combined to give what is known as stereoscopic vision.

With the improvement in the composition of the glass used in microscopes there came a very great improvement in the definition of the image obtained. With the discovery of the way to make lenses out of molten quartz it became possible to construct a microscope which could be used with ultra-violet light and enable objects to be examined that are only one-240,000th of an inch in diameter. Further advancements in microscopy have been made in recent years by the use of polarised light, enabling objects one-sixth of a millionth of an inch in size to be examined; by a system of phase-contrast microscopy whereby extremely transparent objects are rendered clearly visible without staining; and by fluorescence microscopy in which advantage is taken of the properties of certain dyes to shine under the action of ultra-violet light. Recent British work on a reflecting microscope built on the principle of a reflecting telescope shows promise of a resolution far in advance of that which is possible with the ordinary light microscope. The combined use of the microscope and the time lapse cine-camera, where extremely slow growth processes in tissue cultures are speeded up many hundreds of times, holds out possibilities of the study of the ultimate constitution of living matter that may have a revolutionary effect on the progress of mankind. See Achromatic Lens; Electron Microscope; Lens; Metallography; Optics.

Microscopical Society, ROYAL. British learned society, founded in 1839. Its objects are to promote microscopical and biological science by discussion and publication of matters pertaining to the microscope, especially improvements in its construction and application to research. It publishes a quarterly journal. Its h.q. is at Tavistock House South, Tavistock Sq., London, W.C.1.

Microstructure. The appearance of a metal or alloy when viewed through a metallurgical microscope. Specimens are usually prepared by careful polishing of a flat surface of the part of the sample which is of particular interest. If this is examined under vertical illumination, a smooth, mirror-like surface is seen. But if the top surface is removed by etching with suitable acids or salts, the structure of the metal crystals themselves can be discerned. The experienced metallurgist can obtain a very good idea of the type of metal, its method of manufacture, and the properties to be expected, in a sample the microstructure of which he has examined. See Etching; Metallurgy; Polishing.

Microtome (Gr. *mikros*, small; *tomē*, cutting). Instrument for cutting thin sections of organic tissue, etc., for microscopic examination. The substance to be cut is either frozen in gum, etc., or embedded in paraffin or celloidin, which enables slices of any thickness between 0.01 mm. and 0.005 mm. to be obtained.

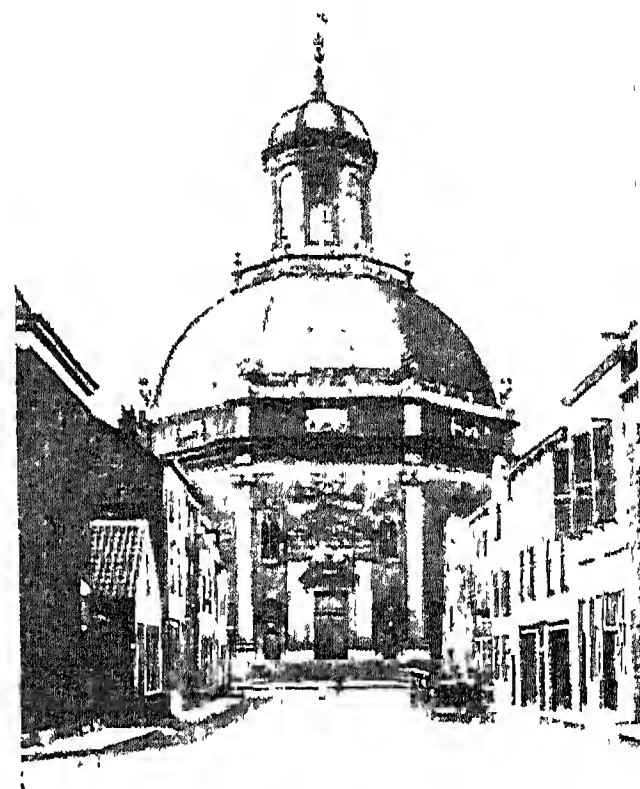
The instrument comprises a razor or a knife-edge which may itself move or remain stationary: in the latter case the specimen to be sliced slides over the cutting edge. In the Cambridge rocking microtome, the substance to be cut is embedded in paraffin contained in a tube, which can be advanced towards the cutting edge in accordance with the thickness of the specimen required, the degree of movement of the tube being read off on an arc graduated in thousands of a millimetre.

Microwaves. Term used in electricity. It refers to electromagnetic waves of length 30 cm. down to 1 cm. or less, the corresponding frequencies being 1,000 and 30,000 megacycles per sec. respectively. Microwaves may be generated by magnetron and velocity-modulated (klystron) valves.

Midas. Legendary king of Phrygia. Having done a favour to Silenus, the companion of the god Bacchus, he was told by the god that whatever he asked of him would be granted. Midas asked that whatever he touched should be turned into gold. Finding that even his food turned to gold before it reached his lips, he asked Bacchus to revoke the gift. By command of the god he bathed in the springs of the river Pactolus, and the baleful power left him; from that time onwards the river was noted for its golden sands. Midas was once chosen to decide in

a contest on the flute and the lyre between Pan and Apollo. Midas having decided in favour of Pan, Apollo changed the king's ears into those of an ass. Midas successfully concealed the deformity from everyone except his barber, who was so oppressed by the secret that, to relieve his feelings, he dug a hole into the ground and whispered into it the words "King Midas has the ears of an ass." From here grew up a reed which, when moved by the wind, divulged the secret to the world. Midas may have been the historical Mita of Mushki (q.v.). *Pron.* my-das.

Middelburg. Capital of the prov. of Zeeland, Netherlands, in the centre of the island of Walcheren, 4 m. N. by E. of Flushing. The industries include engineering.



Middelburg, Walcheren. The Oost Kerk, one of the principal churches

and furniture and tobacco making. The town is encircled by a strip of water known as the Vest. The abbey of S. Nicholas, founded in 1106, and once a Premonstratensian house, was used for administrative purposes, until its destruction by German dive-bombing in May, 1940, when much of the rest of the older part of the town was also flattened. Middelburg, like most of Walcheren, is below sea level, and from the breaching of the sea dykes by the R.A.F. in October, 1944, until their closing a year later the tide washed in and out of the houses of the town, which, however, was never abandoned. In the Middle Ages Middelburg was a cloth centre. Pop. 21,500.

Middelburg. A town in the Transvaal, S. Africa. It is 95 m. by rly. E. of Pretoria. Near by are extensive coal-mines. It is a growing trading centre with rly. connexion to Pretoria, Johannes-

burg, and Lourenço Marques. The Klem Ohlants river, on which it stands, is of great beauty here. Maize, wheat, potatoes, and tobacco are grown in the vicinity. Pop. (1951) 9,364 (4,294 white).

Middelharnis. A village and commune of the Netherlands, in the island of Goeree and Overflakkee, prov. of South Holland. It is the village visible in the distance in Hobbema's famous picture, *The Avenue*, in the National Gallery, London (see Hobbema illus.). Pop. c. 5,000.

Middle Ages OR MEDIEVAL PERIOD. Name given to the ten or eleven centuries beginning with the 5th of our era, and ending with the 15th—the centuries intervening between what are called ancient and modern times. Definite dates for the beginning and the end of the Middle Ages can only be assigned arbitrarily; those most in favour are the sack of Rome by Alaric the Goth, 410, or the deposition of the last Roman emperor in Italy, Romulus Augustulus, 476, and the capture of Constantinople by the Turks, 1453, or the discovery of America by Columbus, 1492. The essential facts are that early in the fifth century the old Roman civilization of Western Europe was submerged by the barbarian flood of Teutonic invasion; a new civilization gradually emerged in a new Europe; and then the new Europe awoke gradually to fresh intellectual ideas, and suddenly to the existence of a whole new world outside itself.

The Middle Ages again fell into two main periods, roughly known as the Dark Ages and the Age of Chivalry, separated by the epoch of the Norman expansion in the second half of the 11th century and the opening of the prolonged contest between the empire and the papacy. Some writers restrict the term Middle Ages to the Age of Chivalry. See Feudalism; History.

Middle Class. Phrase in loose common usage in Great Britain for that section of the community between the nobility and the "working classes." It is sometimes divided into the upper and lower middle classes, but the dividing line is apt to be drawn differently according to the status of the person drawing it. The middle class embraces the majority of the professional, mercantile, and "black-coated" clerical workers, also the decreasing *rentier* group. It was once claimed as a characteristic of members of the middle class that they

expended more effort than others in keeping up an appearance of gentility and respectability in dress, deportment, speech, morals, and culture; but the distinction between class and class being, especially since the First Great War, fluctuating and nebulous, the numerical strength of the British middle class cannot be estimated. The alternative appellation, *bourgeoisie*, is nowadays generally used in a derogatory sense. See Bourgeois.

Middle Congo OR MOYEN CONGO. Administrative dist. of the Belgian Congo, Africa. The Lukisi, Kwango, Kasai, and Congo constitute the greater portion of its boundaries; in the S.W. it is crossed by the railway from Kinshasa through Madimba towards Matadi. See Congo, Belgian.

Middle East. Popular political and geographical division of the East. This somewhat vague term is used to denote that part of Asia which includes India, Afghanistan, Persia, Iraq, and Arabia. A Middle East Command was established during the Second Great War with H.Q. at Cairo. At one time or another it controlled forces in E. and N. Africa, Palestine, Syria, Persia, Aden, and Transjordan. After the war the command was designated Middle East Forces, which was changed to Middle East Land Forces in Aug., 1946.

Middle Lamella. A term used in plant anatomy for the middle layer of a cell wall which is often apparent in sections as by reason of optical or staining properties differing from those of the rest of the wall. It is the persistent though often chemically changed primary wall originally consisting of pectic material which was initiated in the cell plate separating two recently divided nuclei. See Cytology.

Middleman. Term used somewhat loosely to denote a wholesaler or other trader who intervenes in the chain of distribution between the producer and the retailer or the manufacturer and the user. Thus, wine may be bought by A from the producer P, sold to an exporter B, sold by him to an importer C, in turn sold by him to a merchant D, who may sell it to a retailer E, who finally sells it to the consumer F. The intervention of such middlemen as A, B, C, D, and E naturally increases the final price; but most of them, such as B, C and E perform a specialised function, and may do so at a lower cost

than would otherwise be incurred. It does not follow that if a manufacturer sells direct to the public and thus eliminates two middlemen, the wholesaler and the retailer, he will thus complete the chain of distribution more cheaply than the specialised wholesaler and retailer would have done. Opportunities for middlemen may be lessened by (a) government regulation of prices and of profit margins (that is, the percentages that may be added to cost at each stage when fixing the selling price) for the manufacturer, the wholesaler, and the retailer; (b) direct selling by manufacturers to retailers or to consumers; (c) government rationing and control of commodities (this may encourage the activity of middlemen in the "black market," i.e., illicit trading). Sometimes brokers and commission agents are included in the term middlemen.

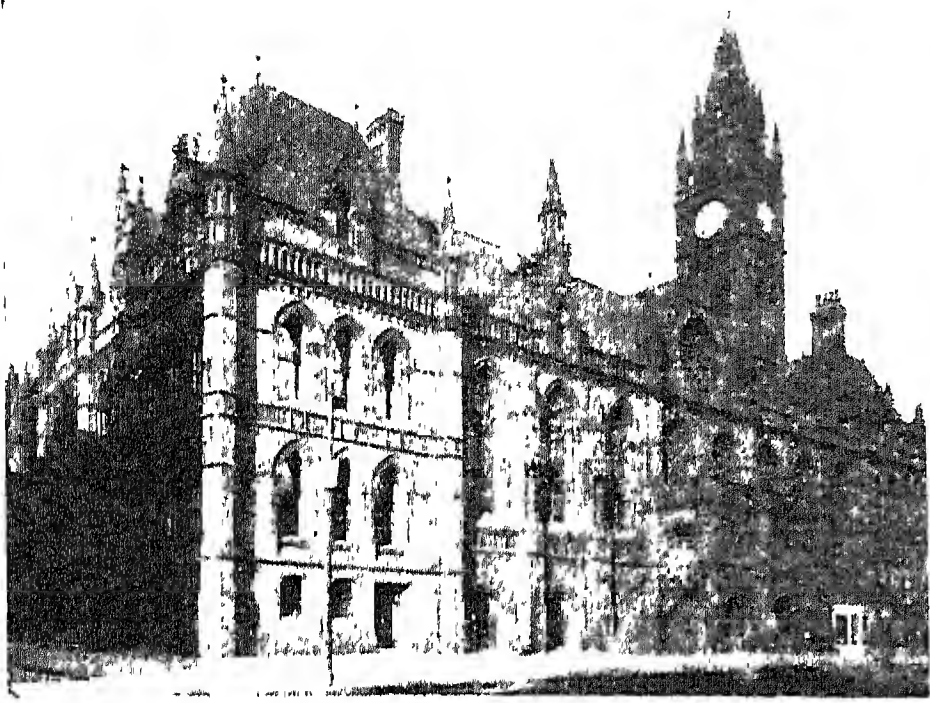
Middlemarch. A novel by George Eliot, originally published in eight parts, 1871-72, with the sub-title, *A Study of English Provincial Life*. It is a story mainly of a modern S. Theresa, Dorothea Brooke, who first, from zeal rather than love, marries the stiff, scholarly, middle-aged egoist, Casaubon, and later his cousin and opposite, Will Ladislaw. Other romances are interwoven with hers.

Middlesbrough. Co. borough and manufacturing town of the N. Riding of Yorks, England. It



Middlesbrough arms

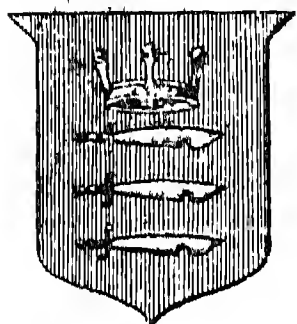
stands on the S. side of the Tees estuary, and is 3 m. E. of Stockton and 238 m. by rly. from London. The chief buildings are those erected for municipal purposes, including the town hall, royal exchange, museum, art gallery, etc. There is also a R.C. cathedral. Middlesbrough is the commercial centre of the coal and ironstone mines of the Cleveland district, and it contains numerous foundries, furnaces, and other works for the production of iron and steel on an enormous scale. Transport facilities by rail, road, and sea are available, and the Tees is spanned by a transporter bridge and a vertical lift bridge, both of unusual design necessitated by the low-lying banks of the river. The docks can accommodate ships of up to 13,000 tons. During the Second Great War Middlesbrough was several times attacked from the air, the raid of



Middlesbrough, Yorkshire. The town hall of this North Riding industrial centre

May 25, 1940, being the first attack on industry in England. Later raids did great damage. With Thornaby-on-Tees, Middlesbrough forms two borough constituencies. Pop. (1951) 147,336.

Middlesex. County of England. On the S. the Thames separates it from Surrey, on the E. the



Middlesex arms

Lea separates it from Essex. Other rivers are the Crane, Colne, and Brent. The surface is fairly level, although there is a range of hills in the N. Area 232 sq. m.

The co. in 1957 included 18 boroughs, and was divided into two co. and 27 bor. constituencies. Brentford acquired in ancient times something of the status of a county town, but the county h.q. has been at Westminster since about 1810. Until the formation of the county of London in 1889, Middlesex extended from the City of London to its present outer boundaries, and Westminster was within it. The county, all of which is within the metropolitan police district, is in the diocese of London. It contains Hampton Court Palace, Syon House, Osterley; the public schools of Harrow, Mill Hill, and Highgate; sports centres at Wembley, Harringay, Twickenham, and Kempton Park.

The 20th century saw the increasing urbanisation of rural Middlesex, and the covering up with houses and factories of much of its fertile market garden soil.

Middlesex, so named because it was between the E. and the W. Saxons, is one of the older English counties. At the time of Domesday it was for the most part forested, and was divided into six hundreds. In 1889 about 50 sq. m.

was taken away for inclusion in the new county of London. Pop. (1951) 2,268,776.

LITERARY ASSOCIATIONS. One of the earliest humorous poems in English is the 14th century skit upon knightly tourneys, *The Tournament of Tottenham*. In the Elizabethan drama are two plays with their scenes laid in Edmonton, the

anonymous *Merry Devil of Edmonton*, and Dekker's *Witch of Edmonton*. It also figures in Cowper's ballad of John Gilpin. Drayton in *Polyolbion* sings of the fine cornlands where now are London's outer suburbs. Pope laid the scene of *The Rape of the Lock* in Hampton Court. Akenside found inspiration in *Golder's Hill*. Scott describes Enfield Chase in *The Fortunes of Nigel*.

Recollections of Enfield inspired a large part of Keats's poem, *I Stood Tiptoe upon a Little Hill*. Hood wrote of the work of a Bedford topiary artist in his poem, *The Two Peacocks*. Cobbett has passages on Middlesex in *Rural*

Rides. Dickens describes Bill Sikes on burglary intent as taking *Oliver Twist* by Isleworth, Hampton, and Shepperton; Thackeray, in memory of his own schooldays there, makes Henry Esmond pass part of his early life at Ealing; while Harrison Ainsworth has much of the county in his *Jack Sheppard*. Matthew Arnold's association with Laleham inspired William Watson's poem, *In Laleham Churchyard*. Consult *The Antiquities of M., M. Sharpe, 1911; Victoria History of the co., 2 vols., ed. W. Page, 1911.*

Middlesex Hospital. London hospital founded in 1745. Situated in Mortimer Street, London, it has over 700 beds, and a special feature is the cancer department, established in 1792. A cancer wing was opened in 1900, and in connexion with it are research laboratories for investigating the nature and causes of malignant disease. A medical school also has facilities for research.

Middlesex Regiment. Unit of the British army. Officially known as the Middlesex Regiment (Duke of Cambridge's Own), it was formed in 1881 by an amalgamation of the 59th Foot, raised in 1755, and the 77th Foot, raised in 1787. The 59th long served as marines, and in India gained the honours Mysore and Seringapatam. Eight honours were won under



Middlesex. Map of this English county, one of the home counties north of the Thames

Wellington in the Peninsular campaigns. At Albuera the infantry brigade, of which the 59th formed

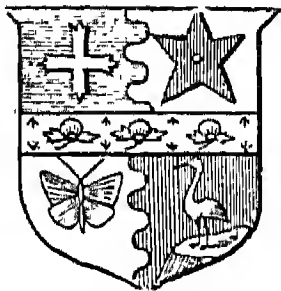


Middlesex Regt.
badge

part, was almost overwhelmed by a superior French force, but their wounded colonel refused to be carried to the rear, and shouted, "Die hard, my men, die hard." After the action the rations for one company were drawn by a drummer in his hat. Since that time the Middlesex Regiment has been known as "Die Hards." In the Crimean War the regiment won three honours and gained four V.C.s at Sevastopol; at Inkerman the 59th suffered such heavy casualties that its strength was reduced to that of a company. The regiment was in the Maori, Zulu, and South African wars.

Forty-six battalions raised for the First Great War earned the honours: Mons; Marne, 1914; Ypres, 1915, '17, '18; Albert, 1916, '18; Bazentin; Cambrai, 1917, '18; Hindenburg Line; Suvla; Jerusalem; Mesopotamia. The regiment served at Murmansk in 1919. Of Middlesex battalions which served in the Second Great War, the 1st surrendered to the Japanese at Hong Kong; the 2nd fought in France, 1939-40, and N.W. Europe, 1944-45; 1/7th, in France, 1939-40, Africa, N.W. Europe; 2/7th, in Africa and Italy; 1/8th, in France, 1939-40, N.W. Europe; and 2/8th, in N.W. Europe. The cypher and coronet in the centre of the badge are those of the duke of Cambridge, and the prince of Wales's feathers and motto perpetuate the original badge of the 77th Foot. The regimental depot is at Mill Hill.

Middleton. Mun. borough and market town of Lancashire, England. It is 6 m. N. of Manchester by rly. and has silk and cotton factories, bleaching, dyeing, and calico-printing works, iron foundries, chemical, soap cigarette, and jam factories, and a rubber industry. Yet despite its industrial development much of the land is wooded or devoted to agriculture. Water is supplied by Heywood and Middleton water board. Middleton and Prestwich is the name of a co. constituency of



Middleton
borough arms

Lanes; it includes Whitefield. Its charter for a weekly market goes back to 1791; market day, Fri. Population (1951) 32,602.

Middleton, EARL OF. Scottish title borne from 1656 to 1695 by the family of Middleton. John Middleton, of Middleton, Kincardineshire, served Charles I in Scotland during the civil war. He was taken prisoner at Preston and at Worcester, but escaped to France and joined the circle around Charles II. In 1653 he was sent to Scotland to lead a rebellion, but this was a failure. Charles created him an earl in 1656, and after the Restoration made him commander-in-chief. He died at Tangier in June, 1674. Middleton's son Charles, 2nd earl (d. 1719), was a secretary of state under James II. He followed the deposed king to France. The title was taken from him in 1695, but was claimed by the Middletons until the death of John, nominally the third earl, about 1746.

Middleton, CECIL HENRY (1887-1945). British gardener and broadcaster. Son of the head gardener on a Northants estate, he entered the seed trade, afterwards becoming a student at Kew. He was on the horticultural staff of the board of Agriculture, 1914-18, and an instructor in horticulture for Surrey county council. In 1931 he began to broadcast talks on gardening, and from 1934 to 1945 his Sunday series, *In Your Garden*, continued without a break, his unpretentious manner bringing him tremendous popularity. In 1937 he was elected an associate of honour of the Royal Horticultural Society, and he was in demand as adviser and judge at shows. He died Sept. 18, 1945.

Middleton, THOMAS (c. 1570-1627). English dramatist. Born in London of a good family, he was a member of Gray's Inn, and wrote some satirical tracts. About 1600 he turned his attention to the stage, composing 15 plays independently, and seven in collaboration with Dekker, Rowley, and others. City chronologer from 1620, he was buried in the churchyard of Newington Butts. His work is marked by coarseness, pointed dialogue, subtle satire, and penetrating wit. Of his comedies

of London manners, *A Trick to Catch the Old One* is the most notable. His best independent tragedy is

Women Beware Women. With Rowley he wrote the powerful tragedy of *The Changeling*, and the comedies *The Spanish Gipsy* and *A Fair Quarrel*. His satirical play, *A Game at Chesse*, 1624, was immediately popular, but was suppressed at the request of the Spanish ambassador. Consult

Works, ed. A. H. Bullen, 1885-86.

Middleton-in-Teesdale. A market town of Durham, England. It stands on the Tees, here bordering Yorkshire, 25 m. by rly. W.N.W. of Darlington. There is quarrying and mining for barytes, but the district is largely agricultural and a centre for walkers. Market day, Tues. Pop. 2,000.

Middletown. Name of several places in the U.S.A. One is a city of Connecticut, the co. seat of Middlesex co. It is on the Connecticut river, 15 m. S. of Hartford, and served by rly. and steamer from New York. Incorporated in 1651, it became a city in 1784. Between 1750 and 1800 it was Connecticut's wealthiest centre. Products include typewriters and rubber fabrics. Pop. (1950) 29,711.

Another Middletown, in Orange co., N.Y., is on the Wallkill river, 65 m. N.W. of New York city. Incorporated 1818, it became a city forty years later, and has developed from an agricultural market town into an industrial centre producing printers' supplies, machine tools, women's wear, and leather goods. Pop. (1950) 22,586.

A third Middletown is a city in Butler co., Ohio, on the Miami river, 33 m. N. of Cincinnati. Outstanding products are paper, rust-resisting steel for prefabricated houses, and a chewing tobacco (annual output, 17 million lb.). It was incorporated in 1833. Pop. (1950) 33,695.

Middletown was the name used to cover the identity of Muncie, Indiana, by R. S. and H. M. Lynd in their social studies of a typical American city of the Middle West (*q.v.*), *Middletown*, 1929, *Middletown in Transition*, 1937 and 1947.

Middle Wallop. R.A.F. aerodrome in Hampshire, England. Situated 5 m. S.W. of Andover, it was one of the stations of No. 11



Thomas Middleton,
English dramatist
After J. Thurston



C. H. Middleton,
British gardener

group, Fighter Command, in the Second Great War, and was damaged by German bombers in the Battle of Britain. Later it was a night fighter base and prominent in the air defence of London. Over Wallop and Nether Wallop are other villages in the district. Wallop is the family name of the earls of Portsmouth.

Middle West. Accepted name for the N. central section of the U.S.A. It consists of the region extending from the Rocky Mts. to the Alleghenies, N. of the Ohio River and the S. boundaries of Missouri and Kansas. It is chiefly industrial and agricultural. Many of its inhabitants, especially in rural areas, are of German and Scandinavian descent. Before the shock of the Japanese attack on Pearl Harbour they took little interest in foreign policy, and are apt to be suspicious of Wall Street and Washington bureaucracy: they often show a marked independence of party machines, but exert considerable influence on public affairs.

Middlewich. Urban district of Cheshire, England. It is 6 m. S. of Northwich, near the river Dane and is served by rly. and the Trent and Mersey canal. The chief building is the old church of S. Michael, a place of refuge for Royalists in the Civil War. Salt is extracted here, and chemicals, sanitary ware, and clothing are made. Middlewich is in the centre of the wiches, or salt towns, of Cheshire, hence its name. Pop (1951) 6,736.

Middlings. A technical term used in flour milling and in metallurgy. In flour milling, it is applied to a mixture of broken up bran or husk, with a small proportion of flour mostly adhering to the bran. It is one of the so-called "offals" of the old process of flour milling, and is used for poultry and pig feeding. A newer meaning refers to a product of the process of flour milling, by roller mills. These first break up the grain of the wheat into a product which apart from the bran may be separated into three grades known as semolina, middlings, and dunst.

In metallurgy, the term refers to a product of the grading or concentration of ores. This grading may divide the ore into two parts only, the one rich in metal and the other worthless; but frequently there are three products, a rich one ready for immediate smelting or other treatment; an intermediate one which will be submitted to a further preliminary treatment; and a third which is worthless, and

is rejected. These are known respectively as heads, middlings, and tailings. See Metallurgy.

Midge. Name vaguely applied to many two-winged flies or Diptera (*q.v.*). They have narrow,



Midhurst, Sussex. Ruins of Cowdray Castle, a Tudor mansion formerly the seat of the earl of Egmont

elongated bodies, slender legs, and usually thread-like antennae often densely plumose in the males. The name refers more particularly to members of the family Chironomidae that are often seen dancing in swarms on summer evenings, especially near water. Midges usually resemble gnats or mosquitoes (*q.v.*) in general appearance but lack the piercing mouth-parts of those insects. An exception is the group of minute midges belonging to the allied family Ceratopogonidae, which have lancet-like mouth-parts and suck blood. With this habit species of *Culicoides* often cause much annoyance on summer evenings, especially in Scotland. Other flies known as midges are the Cecidomyiidae, or gall-midges, which include the Hessian fly.

Midhat Pasha (1822-84). Turkish politician. Born in Constantinople (Istanbul) he entered the Turkish civil service and was governor of Bulgaria, 1862-67. Becoming grand vizier in 1876, he was a prime mover in the deposition of Abdul Aziz. He drew up



Midhat Pasha, Turkish statesman

the draft constitution of the Ottoman Empire, but was banished in 1877. Allowed to return next year, he was nominated governor of Syria. Sentence of death passed upon him in 1881, on a charge of murdering Abdul Aziz, was commuted to banishment through the representation of the British government. He died in Arabia, May 8, 1884.

Midhurst. Market town of Sussex, England. It stands on the Rother, 12 m. by rly. N. of Chichester. The church, dedicated

to S. Mary Magdalene and S. Denis, is Perpendicular. There was a castle here, the seat of the Bohuns, in the Middle Ages. There is a 17th cent. grammar school and the Spread Eagle hotel dates in part

from the 15th cent. About 4 m. N. is the King Edward VII sanatorium for consumptives, opened in 1905. Near the town, which is surrounded by some of the most lovely scenery in Sussex, are the ruins of Cowdray Castle, now the property of Viscount Cowdray. Midhurst was a borough in the Middle Ages, but lost its rights and was long governed by a bailiff elected in the manorial court. It was separately represented in parliament from 1300 to 1885, and had its markets and fairs. Market day, Thurs. Pop. 3,000.

Midi. District of France. Without any defined area, it is generally regarded as the region between the Bay of Biscay and the Mediterranean. Toulouse is its capital. It was originally the Middle Land between France and Spain.

Midi, AIGUILLE DU. Mt. in France. A peak of the Mont Blanc chain, S.E. of Chamonix, its alt. is 12,600 ft. See Mont Blanc.

Midi, CANAL DU. Canal of S. France. It runs from Toulouse to La Nouvelle, near Narbonne, on the Étang de Thau. Known also as the canal du Languedoc, it connects with the canalised Garonne, and thus unites the Mediterranean with the Atlantic. Built during 1666-81 by Paul Riquet, it is still an important waterway for the trade of the S.W. depts. In its 148 m. there are 100 locks, and the chief towns served are Toulouse, Villefranche, Castelnaudary, Carcassonne, and Narbonne.

Midi, PIC DU. Mt. of the Pyrénées, in S. France, entitled in full Pic du Midi d'Ossau. It is nearly due S. of Pau and almost on the Spanish frontier. The Grand Pic has an alt. of 9,465 ft. and the Petit Pic of 9,135 ft. Just below the summit is an observatory where in 1931 the solar corona was first photographed in full sunlight.

Midian. An ancient region of Arabia. The territory of the Midianites, a tribe descended, according to Genesis, from Midian, a son of Abraham by the Arabian Keturah, it extended along the E. coast of the Gulf of Akabah. The Midianites, who were partly nomadic and traded by caravan with Egypt and Syria also inhabited Sinai and the S. borders of Palestine. To merchants from Midian Joseph was sold by his brethren. Moses married a daughter of Jethro, probably a priest of Baal-Peor, the national god. The Midianites often joined with the Moabites against the Hebrews, but were defeated by Gideon (Judges 7).

Midland. Town in Simcoe co. Ontario, Canada, on Georgian Bay, 89 m. N. by W. of Toronto, on the C.P.R. and C.N.R. It has four large grain elevators, timber, silk and woollen mills, foundries and machine shops, and shipbuilding yards. Pop. (1951) 7,206.

Midland Bank. English banking company. Founded in 1836 as the Birmingham and Midland Bank, it was amalgamated with the Central Bank of London in 1891. In 1898 its title was changed to London City and Midland Bank. The City Bank was then taken over, and there followed a series of amalgamations with organizations in provincial cities. In 1908 the North and South Wales Bank, in 1914 the Metropolitan Bank, were taken over. In 1917 the share capital of the Belfast Banking Co. was bought; that of the Clydesdale Bank was acquired in 1920.

that of the North of Scotland Bank in 1924, these two amalgamating in 1950 as the Clydesdale and North of Scotland Bank, Ltd.

The London City and Midland had a paid-up capital of £5,189,000 in 1918 when it combined with the London Joint Stock Banks to form the London Joint City and Midland. The name was changed to Midland Bank Ltd. in 1923. By 1958 there were over 2,150 branches in England and Wales, with agents in all parts of the world; and the paid-up capital exceeded £16,159,000. The head office is in Poultry, London, E.C.2.

Midland Canal (Ger. Mittel-landkanal). German system of inland waterways for ships up to 1,000 tons, linking the rivers Rhine and Elbe, and constructed from 1905 onwards. It includes the Rhine-Herne and Dortmund-Ems canals, and reaches the Elbe near Magdeburg. Dams, sluices, and power stations were included in the huge project, which was to link Berlin and Hamburg, and thereby the Baltic and North Sea, with the Ruhr. The system, severely damaged in the Second Great War, was soon reconstructed.

Midlands. Term used for the counties in the middle of England. The limits of the Midlands cannot be exactly defined, but they lie approximately between Yorkshire and the Thames, and between East Anglia and the Welsh border counties. The Midland judicial circuit includes Lines, Derbyshire, Leics, Rutland Northants, Warwickshire, and Worcestershire.

Midleton or MIDDLETON. A market town and urban dist. of co. Cork, Irish Republic. It stands on the Owencurra, which enters Cork harbour just below the town, 13 m. E. of Cork. There is a grammar school founded in 1709, and a Cistercian abbey once stood here. The site of the place is the property of the earl of Midleton. Market day, Sat. Pop. (1956) 2,781.

Midleton, St. John Brod-

rick, 1st Earl of (1856-1942). British politician. Born Dec. 14, 1856, the eldest son of the 8th Viscount Midleton (1830-1907), he was educated at Eton and Balliol College, Oxford, and became Con-

1st Earl of Midleton, British politician

servative member of parliament for West Surrey in 1880. Made financial secretary to the War office in 1886, he was under-secretary for foreign affairs in 1898; and secretary for War in 1900. In 1903 he was transferred to the secretaryship for India, going out of office in 1905. In 1907 he succeeded to his father's viscounty. He was a leading figure among the Unionists in discussions on the settlement of Ireland, and was elected a senator of the I.F.S. in 1921. Created K.P. in 1915 and earl in 1920, he died Feb. 13, 1942.

Midlothian. County of Scotland. It has a short coastline on the Firth of Forth, at Musselburgh, and surrounds the city of Edinburgh (administratively a separate county). Elsewhere it borders the cos. of West Lothian, Lanark, Peebles, Selkirk, Roxburgh, Berwick, and East Lothian. It has no co. town, but is administered from County Buildings, Edinburgh.

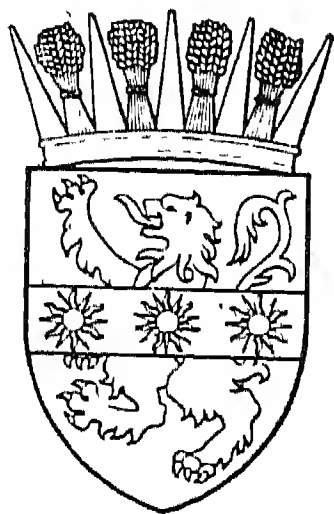
Midlothian is a sloping plain rising from the Firth of Forth in the north to the Moorfoot Hills in the S.E. The Pentland Hills traverse the plain from N.E. to S.W., rising to heights approaching 1900 ft. The chief rivers are the Almond, Water of Leith, N. and S. Esk, Tyne, and Gala. The co. includes five small burghs of Bonnyrigg and Lasswade, Dalkeith, Loanhead, Musselburgh, and Penicuik, and such picturesque spots as Roslin, Hawthornden, and Newbattle. Oats, barley, potatoes, swedes, and wheat are grown; and sheep, pigs, cattle, and poultry are reared. Coalmining is the principal industry, and oil shale, sand-



Midlothian. Map of the Scottish county south of the Firth of Forth, rich in historic and antiquarian associations

fire-clay, roadstone, limestone and sandstone are extracted. The largest manufacturing industry is paper making. Engineering, textiles (carpets), and food production are important.

The main road and railway systems radiate from Edinburgh. The county, for the burgh of Musselburgh, which is part of Edinburgh (East) constituency, forms a county constituency. Midlothian is



Midlothian arms

rich in historic remains dating from pre-Roman times, and there are ruined castles at Borthwick, Crichton, and Roslin; Rullion Green, Carberry Hill and Pinkie are historic battlefields. Area 312.8 sq. m. Pop. (1951) 98,974.

Midlothian Campaign. See under Gladstone, W. E.

Midnapur. Dist. and town of India, in the Bardwan division, W. Bengal. The dist. lies in the S.W. of W. Bengal. The E. portion, an alluvial plain producing much rice, is densely populated; the W. is jungle and sparsely peopled. The town is an important rly. junction on the Kasai river, 60 m. W. of Calcutta, to which it is joined by canal. District area, 5,258 sq. m. Pop. (1951) dist., 3,359,022; town, 45,476.

Midnight Sun. Appearance of the sun above the horizon at midnight. It may be witnessed at any point on the Arctic circle on the N. summer solstice, June 21, and on the Antarctic circle on the S. summer solstice, Dec. 21. Within these circles the length of time the sun is in the sky without setting gradually increases, being 72 days in lat. 70°, and 138 days in lat. 80°, whilst the sun does not set for six months at the poles. Tourists visit the N. of Norway to see the phenomenon.

The Antarctic has long spells of sunshine in summer. During Scott's 2nd expedition the burn on the sun card at Cape Evans (77½° S. 166½° E.) was frequently unbroken for 24 hrs.; between Dec. 9 and 12, 1911, there was a continuous record of 66½ hrs. of sunshine.

The phenomenon of the midnight sun is due to the inclination of the earth's axis, at 66½° to the plane of its orbit round the sun. Since the direction of the axis in space is the same at all times, at

one point (the summer solstice) the entire arctic circle is illuminated, the Antarctic being in total darkness. Six months later the position is reversed.

Midrash. An ancient Hebrew commentary on the O.T., consisting of a vast number of comments by various authors, mixed with tales and folklore. The term is also applied to the edifying tales in the O.T. illustrating religious truths, such as the books of Ruth and Jonah. It was the storehouse from which the Rabbis drew most of their teaching. See Mishna.

Midshipman. In the British navy, a boy undergoing training preparatory to being commissioned as an officer.



Midshipman's uniform, British Navy

The name derived from the fact that the quarters of the "young gentlemen" qualifying for commissions were situated amidships on the lower deck.

Formerly boys entered the Royal Naval College, Dartmouth, at 13½ for a four-year course or were admitted as cadets from public schools at 17½ to 18 years old and stayed for four months. At the end of their time cadets spent eight months getting sea experience in a training cruiser, when those successful in the passing out test were promoted midshipmen. Until 1953 midshipmen went to sea on operational units of the fleet, continuing their scholastic education and professional training

under a naval instructor and taking part in the daily routine of the ship. Midshipmen messed in the gun-room. Their distinguishing badge is a white tab on the jacket collar. They wear a white lanyard and carry a dirk.

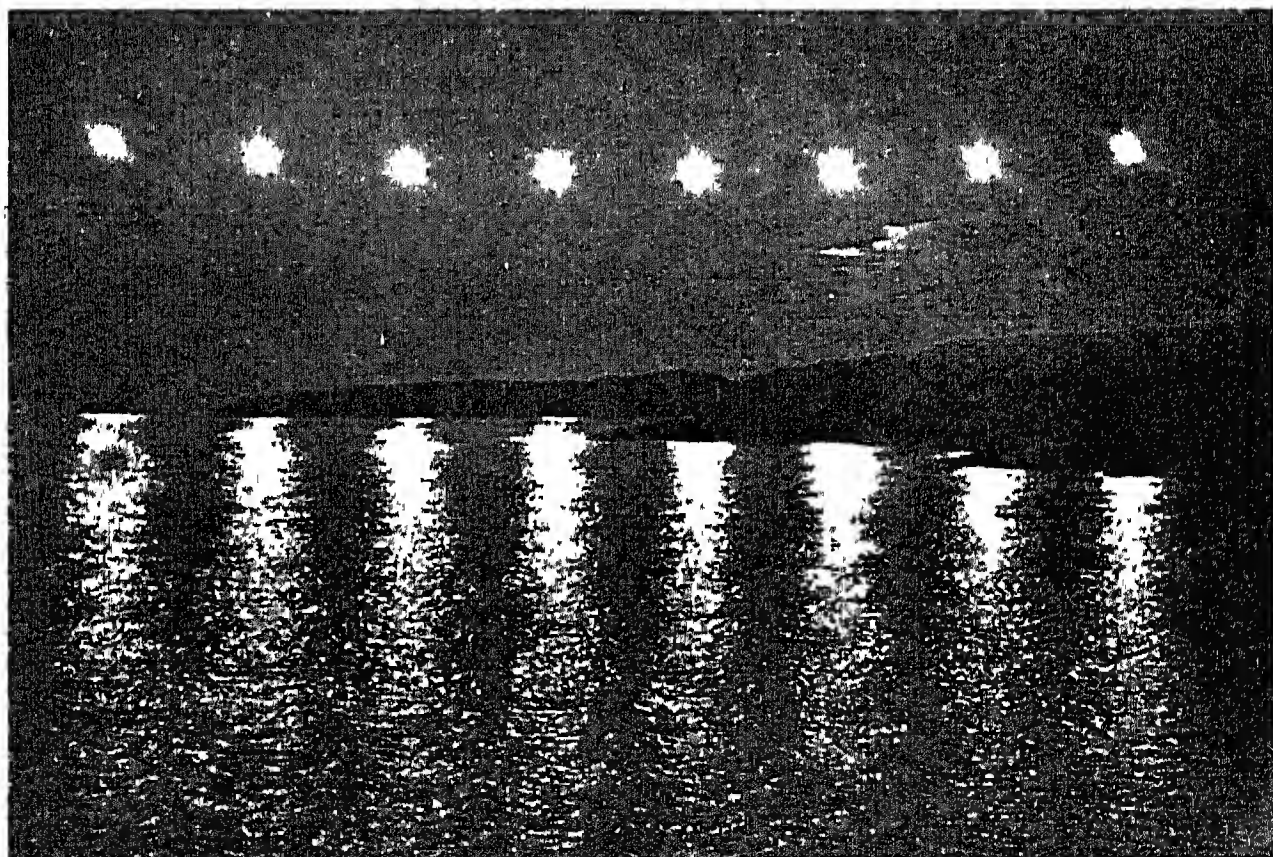
For the method of Dartmouth entry introduced in 1953, see Naval Cadet.

Midshipman Easy. Central character of the novel by Capt. F. Marryat, described under its full title Mr. Midshipman Easy.

Midsomer Norton. Part of the urban dist. of Norton-Radstock, Somerset, England. It is 12 m. S.S.W. of Bath, on the rly. and the little river Somer. The chief building is the Perpendicular church of S. John the Baptist, rebuilt in the 19th century. The small Somerset coalfield is near by.

Midsummer Day. June 24, popularly the middle day of summer. Astronomically the period of the summer solstice (about June 21) is the beginning of summer. Midsummer Day is the feast of the Nativity of S. John the Baptist and is an English quarter day. In some English towns and villages, stools decorated with flowers stuck in clay were placed by the house-doors or at cross-roads on this day, a custom possibly derived from the Roman festival in honour of the deities of the crossroads. The term "midsummer madness" may refer to the wild festivities of Midsummer Eve, or to the supposed effect of the midsummer moon. "Midsummer Man" is the plant orpine (*Sedum telephium*) used by girls on Midsummer Eve as a test of their lovers' fidelity.

Midsummer Night's Dream, A. Fairy comedy by Shakespeare, containing some of his most de-



Midnight Sun. Photograph with eight exposures at intervals of 45 minutes, showing that the sun during this period is not setting. See text

lightful flights of fancy. The scene is laid partly in Athens, but mostly in a so-called "wood near Athens," which is in many ways as English a wood as could be conceived, just as the artisans who assemble there to rehearse a play for the nuptials of Theseus, duke of Athens, are robustly English, even in their names — Nick Bottom, Peter Quince, Francis Flute, Tom Snout, etc. The wood is peopled by the fairies of English tradition, including Oberon, their king, and Titania, their queen, also the mischievous Puck or Robin Goodfellow. The artisans, as well as two young couples crossed in love who have fled for various reasons to the wood, become involved in the quarrel of Oberon and Titania and the pranks of Puck, and the comedy is rich; Bottom for example, is given an ass's head and Titania, under a spell, falls in love with him. Even after the dénouement and the rectification of all errors further comedy is provided by the artisans' performance of the story of Pyramus and Thisbe. But the fairies hold the stage to the last.

Written 1594, and first published in quarto form 1600, the play has 878 lines in blank verse and 731 pentametric rhymes. There have been many notable modern presentations in London, including those of Tree (His Majesty's, 1900 and 1911), Granville-Barker (Savoy Theatre, 1914), Gielgud (Haymarket, 1945), and several at the Open Air Theatre at Regent's Park.

The play has always attracted leading actors. Bottom, for example, has been memorably played by Samuel Phelps, Tree, Oscar Asche, Arthur Bourchier, Nigel Playfair, Ralph Richardson, Robert Atkins, Donald Wolfitt, Francis L. Sullivan, Leslie Banks; Titania by Lady Tree, Gwen Ffrangcon-Davies, Jean Forbes-Robertson, Fay Compton, Peggy Ashcroft; Oberon by Mme. Vestris, Julia Neilson, Denis Neilson-Terry, Phyllis Neilson-Terry, Gladys Cooper, Jean Forbes-Robertson, Nicholas Hannen, John Gielgud, Robert Helpmann. The play has long been popular with amateurs, especially for open-air performance, also in schools, the play serving as an admirable introduction to Shakespeare. A film version directed in America by Reinhardt, 1934, was chiefly notable for the casting of James Cagney, famous in gangster parts, as Bottom. Mendelssohn's in-

cidental music, which includes the familiar Wedding March, was first performed in Berlin, 1843.

Midway Islands. Group of islands belonging to the U.S.A. in the N. Pacific, about 1,200 m. N.W. of Honolulu. They are unproductive, being little more than sand dunes. Discovered in 1859, they were formally declared a U.S. possession in 1867. They are a base for trans-Pacific air services. Area 2 sq. m. Pop. (1950) 416.

During the Second Great War they successfully resisted Japanese attempts at invasion; and off the Midways in June, 1942, a U.S. fleet decisively defeated a Japanese force. *See under* Pacific War.

Midwife. Woman who assists during childbirth. In the U.K. her status, training, and necessary qualifications are governed by act of parliament, an act of 1951 consolidating earlier legislation from 1902. With a few exceptions, any man, or woman not a certified midwife or registered nurse, who for remuneration attends as a nurse on a woman in childbirth, or as a maternity nurse within ten days after, is liable to a fine.

The Midwives Act of 1902 set up the central midwives board to control the training, examination, and registration of midwives in England and Wales; its offices are at 73, Great Peter Street, London, S.W.1. No woman can be certified as a midwife unless she has followed a prescribed course of study and passed certain examinations.

Midwives, ROYAL COLLEGE OF. British institution founded in 1881 to improve the efficiency and status of midwives. Its work was an important factor in the passing of the first Midwives Act, 1902 (*see under* Midwife). Recognized as the negotiating body for midwives, it also arranges refresher and other courses, appoints representatives to the central midwives board and to other appropriate bodies and committees, and provides the h.q. for the International Confederation of Midwives. In 1957 it had throughout the U.K. some 10,000 members. Its address is 15, Mansfield Street, London, W.1.

Mieres. Town of Spain, in the prov. of Oviedo. On the river Nalon, it is the centre of the Asturian mining industry, and has iron foundries, steel and zinc works, blast furnaces, and chemical works. Pop. (1950) 58,310.

Mierevelt, MICHEL JANSZ VAN (1567-1651). Dutch painter. Born at Delft, May 1, 1567, he studied there under Willemsz and Augustyns, and at Utrecht under An-

tonio Blokland, 1579-83, and became court painter to the prince of Orange. He was famed for his numerous portraits, executed with a skill and attention to detail which compensate for a certain coldness in treatment.

Among his portraits are those of Grotius, Gustavus Adolphus of Sweden, Huygens, Coligny, the duke of Buckingham, and William the Silent, and he left also some still life and genre paintings. Examples are to be seen in the Ryks museum, Amsterdam, the Louvre, The Hague, Dresden, Berlin, and one in the National Gallery, London. He died at Delft, July 27, 1651.

Mieris, FRANS VAN, THE ELDER (1635-1681). Dutch painter. Born at Leyden, April 16, 1635, he

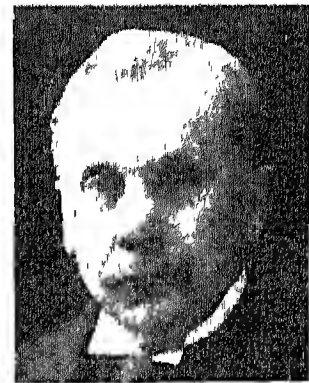
was a pupil of Gerard Douw, and became a member of the Leyden Guild, 1658. He painted scenes of better class Dutch life. He died at Leyden, March 12, 1681. His sons Jan and Willem



Frans van Mieris,
Dutch painter

were painters of repute as was also his grandson Frans.

Miers, SIR HENRY ALEXANDER (1858-1942). British scientist. He was born at Rio de Janeiro, May 25, 1858, and educated at Eton and Trinity College, Oxford, and was assistant at the British Museum, 1882-95. Instructor in crystallography at the central technical college,



Sir Henry A. Miers,
British scientist
Russell

S. Kensington, 1886-95, he was Waynflete professor of mineralogy, Oxford, 1895-1908, and principal of London university, 1908-15. From 1915 to 1926 he was professor of crystallography and vice-chancellor of Manchester university. He was elected a trustee of the British museum in 1926 and held various official positions in connexion with the control of museums. On the formation of the



M. van Mierevelt,
Dutch painter
After Van Dyck

Gemmological Association of Great Britain in 1932 he was elected its first president. His publications included *The Soil in Relation to Health* (with R. Crosskey), 1893, and *Mineralogy*, 1902. A knight from 1912, he died Dec. 10, 1942.

Migmatite (Gr. *migma*, mixture). In geology a type of rock occurring in regions of intense metamorphism where the normal country rock is intimately mixed with granitic material which may have been injected or may have soaked into the host rock. Migmatites, first described from Finland, also occur in Sutherland.

Mignet, FRANÇOIS AUGUSTE MARIE (1796–1884). French historian. Born at Aix-en-Provence,



François Mignet,
French historian

May 8, 1796, he studied at Avignon and Aix, and became a lawyer. He made a name, however, by his historical work. His *History of the French Revolution*, 1824, is still standard, while his studies on the history of the 16th and 17th centuries—

Antonio Perez and Philip II, 1845; Charles V and his Abdication, 1854; and Mary Stuart, 1851—are marked by the same accuracy and clearness. He also wrote upon the history and institutions of France in the Middle Ages. He died March 24, 1884, in Paris.

Mignonette (*Reseda odorata*). Perennial herb of the family Resedaceae. Its native country is unknown; but, introduced to British gardens from Egypt in 1752, it has become one of the most popular of plants owing to its fragrant flowers. The stem branches from its base, and the plant becomes a rather diffuse clump, bearing alternate lance-shaped leaves which may be simple or three-lobed. The flowers are borne in dense pyramidal racemes at the ends of the shoots. The calyx is in six parts, and the cream-coloured petals are divided into slender segments. The most conspicuous feature is supplied by the numerous red stamens. Usually grown as an annual, it succeeds in almost any garden soil; best results are obtained on rich, heavy soil, to which old mortar has been added. Seed should be sown very thinly. *R. lutea*, the wild mignonette, is found in Britain in Limestone districts.



Mignonette.
Foliage and flower

Migraine. Severe headache, often one-sided, associated with nausea or vomiting. It is usually accompanied or ushered in by disturbance of any of the five senses, such as flashes of light before the eyes or sound sensations. Initially migraine probably arises from allergy. In patients who are badly adjusted to the strains and stresses of life it tends to become an escape mechanism. Migraine also always argues the presence of infected sinuses, and the primary cause is often a blocked nasal passage. The liver of the sufferer from migraine nearly always functions badly, failing in one of its main tasks, that of detoxication, and so allowing poisonous material to find its way into the blood stream. Treatment consists in the disinfecting of the sinuses and in easing the work of the liver by removing from the diet milk, fats, pork, chocolate, and rich cheese.

Migration (Lat. *migrare*, to move). Term for the movement, usually the mass movement, of living creatures from one place of residence to another.

HUMAN MIGRATION. This is discussed under Emigration; Immigration (*qq.v.*).

ANIMAL MIGRATION. Many animals spend parts of their lives in one place and parts in another. It is very common to find that the change-over from one habitat to the other takes place at a time when the seasons are changing in an important respect. This seasonal change of habitat, involving almost or quite all the individuals of a recognizable population nearly simultaneously, is migration in its strict sense, though the word does duty for other things, *e.g.* the slow or sudden irreversible movement of populations into exploitable, but not hitherto exploited, areas, and the helpless drifting of weak things in currents set up in the water or the air.

Birds make more of a show of their migrations than most other animals, and for that reason bird migration occurs first to most people when they think of animal migration. Birds, however, have by no means a monopoly of



Migration. A dense flock of starlings migrating from Hickling Broad, Norfolk. Seasonal mass migration is common to several other species of birds

seasonal migration. Fish, worms, newts, monkeys, whales, butterflies (and nomadic man) all migrate to some degree in this sense.

The two great problems of migration are: what it is that starts so many individuals off on their journeys at almost the same time; how they find their way. To neither of these questions can the biologist give anything like a satisfactory answer, but it can be said that migration, and the timing of migration, are related sensibly to two of the great activities, two of the great needs, of animals: reproduction and the search for food. In mammals and in birds the mechanism which controls the timing of reproduction is partially understood. It depends upon a most complicated interaction of a number of endocrine glands of which one of the most important, playing probably the master controlling part, is the pituitary gland (*q.v.*) lying at the base of the brain. There is no doubt that this gland—in particular its anterior part—produces substances (hormones) which initiate and maintain the activities of the gonads that lead to reproduction.

Stimulus of Light

Considerable evidence shows that in certain forms, *e.g.* the ferret, light stimulates the pituitary and starts the reproductive process. Most animals which migrate to breed move towards the poles in the summer of the hemisphere in which they live. This means that they move to a region of longer day—for instance, a goose feeding in winter in Somerset may move to Finland to breed, where it will find nearly twenty-four hours of daylight. As well as the direct stimulus of light falling on the eyes it seems that the added hours of bodily activity increase the activity of the pituitary, at least in birds. (This principle has its practical application in commercial egg-production, where artificial illumination of hen-houses increases production of eggs.)

As regards food supply, animals eat either plants or other animals which have eaten plants. Therefore the food supply of animals depends upon the condition of the plants of any area. In the autumn of each hemisphere the long polar night begins to set in towards the poles and spreads, in the northern hemisphere southwards and in the southern hemisphere northwards. As it spreads vegetation dies, and in the extreme case of the far north and the far south is obliterated temporarily by snow and ice.

Animals, therefore, which, for the reasons given above, breed well in the long days near the pole, eating the short-lived vegetation of the summer, or eating other animals feeding upon this in their turn, have to move away from the poles for their winter food.

The why of seasonal migration is thus reasonably explained, but not the how. The only hint is that light does seem to play a considerably more important part in initiating, and perhaps even in directing, migration than does temperature. Of the mechanism by which animals find their way to regions suitable for breeding or for feeding, biologists are in almost complete ignorance. Very little indeed is known about how any animal finds its way about, over long or short distances. The problem presented by the dog or the cat or the pigeon which finds its way home from distant places has scarcely yielded at all to the most elaborate investigation. So far as migration is concerned, it has been suggested that there may be some mechanism in the inner ear which acquaints the animal with the direction of the rotation of the earth, but there is little or no evidence to support this. It does appear that some people are more aware of the points of the compass than others, and there are people who seem to feel some uneasiness if they believe themselves to have lost their orientation, but these are vague indications of little or no scientific value. Vision appears to play a considerable part in an animal's finding its way, and fog is a disturbing factor in migration. Homing pigeons usually refuse to fly in fog; but it has been found that pigeons released from aircraft which subsequently sank at sea found their way home in fog; when confronted with the absolute necessity of flying or drowning, they flew home.

The size and complexity of the problem of migration can be indicated from considering a few examples. In insects there are large movements involving great numbers of individuals among the locusts (*q.v.*) and, less well-known but equally remarkable, among the beetles, the dragonflies, and the butterflies. The American monarch butterfly, for instance, is found in summer in Alaska, in winter in Mexico, where it hibernates more or less completely, and in the same location year after year. The difficulty of understanding this is increased by the fact that, so short is the life-cycle

of this animal, one or two generations have passed in the interval between the departure of the species in the spring from Mexico and its return in the following autumn. How the butterflies find their way back to the same trees that their grandparents used is quite unknown. A similar problem is posed by the behaviour of the eels (*q.v.*) which breed at sea, in the south Atlantic, and appear to return to the streams and ponds of Europe and of America respectively inhabited by their forefathers. The salmon, too, return to the river in which they passed their youth after a considerable period as young and adult fish at sea. In these rivers they spawn, and the cycle is repeated.

Spasmodic Migrations

The enormous and spectacular movements of such mammals as the marten and the grey squirrel in the New World, or of the lemming in Scandinavia, are probably to be regarded rather as one-way pressure movements in response to hunger than as migration. They are essentially spasmodic, and not rhythmical. Hunger in this context includes the desire for water, and for salt, both of which may run short if a population grows suddenly.

Animals are not static. They are not only selected by their environment. They can, and do, also select surroundings that suit them. When their demands change seasonally or rhythmically, the exercise of this choice requires seasonal or rhythmical movement. When circumstances, or the density of their populations, change spasmodically, spasmodic movements follow. But knowledge of how these movements are directed is for the future. *Consult* Migration of Fishes, A. Meek, 1916; Bird Watching, J. Fisher, 1941.

Paul G. 'Espinasse

Miguel, MARIA EVARIST (1802-66). King of Portugal. He was born at Lisbon, Oct. 26, 1802 the



Dom Miguel,
King of Portugal

third son of John VI of Portugal. On the death of John VI in 1826, Miguel's brother, Dom Pedro, already emperor of Brazil, abdicated his rights in favour of his younger daughter, Donna Maria, on condition that she married Miguel, but this she refused to do. Dom

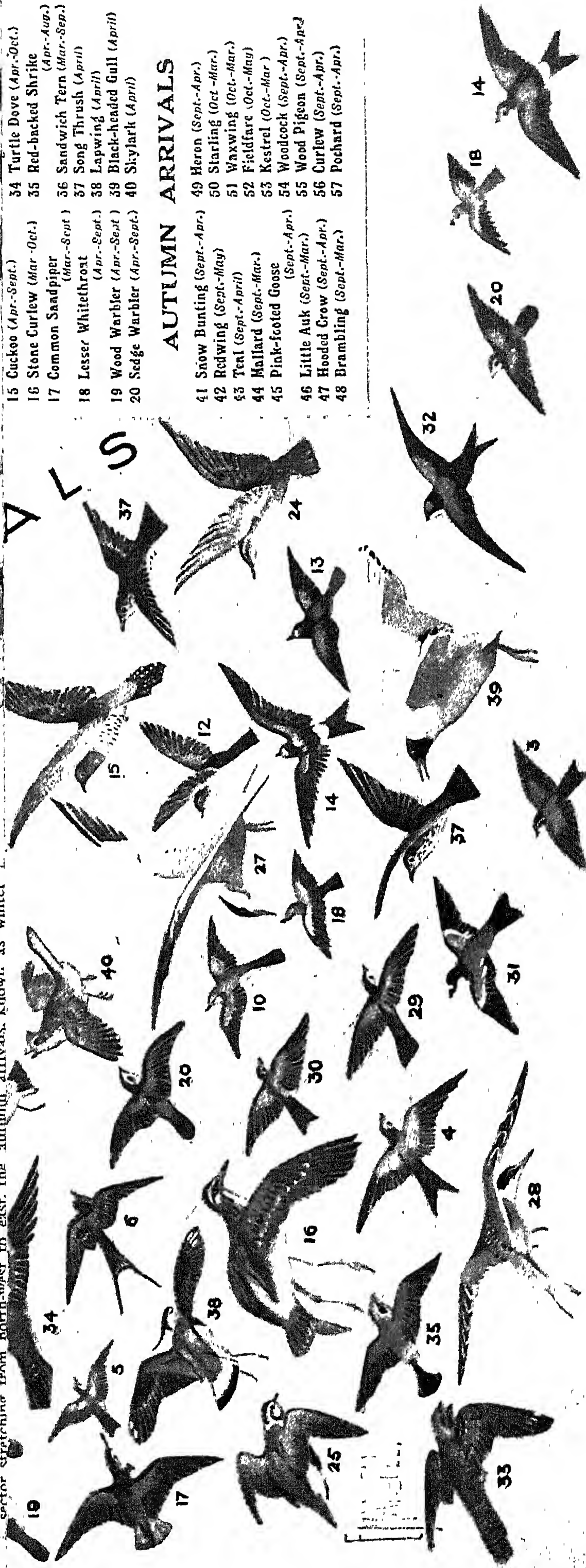
MIGRATION OF BRITISH BIRDS

In this plate, showing the general direction taken by bird migrants to the British Isles, we see the so-called summer visitors arriving between March and May from their winter quarters in Africa and other southern lands, and, approaching along a wide sector stretching from north-west to east, the autumn arrivals, known as winter

- 15 Cuckoo (Apr.-Sept.)
- 16 Stone Curlew (Mar.-Oct.)
- 17 Common Sandpiper (Mar.-Sept.)
- 18 Lesser Whitethroat (Apr.-Sept.)
- 19 Wood Warbler (Apr.-Sept.)
- 20 Sedge Warbler (Apr.-Sept.)
- 34 Turtle Dove (Apr.-Oct.)
- 35 Red-backed Shrike (Apr.-Aug.)
- 36 Sandwich Tern (Mar.-Sept.)
- 37 Song Thrush (April)
- 38 Lapwing (April)
- 39 Black-headed Gull (April)
- 40 Skylark (April)

AUTUMN ARRIVALS

- 41 Snow Bunting (Sept.-Apr.)
- 42 Redwing (Sept.-May)
- 43 Teal (Sept.-April)
- 44 Mallard (Sept.-Mar.)
- 45 Pink-footed Goose (Sept.-Apr.)
- 46 Little Auk (Sept.-Mar.)
- 47 Hooded Crow (Sept.-Apr.)
- 48 Brambling (Sept.-Mar.)
- 49 Heron (Sept.-Apr.)
- 50 Starling (Oct.-Mar.)
- 51 Waxwing (Oct.-Mar.)
- 52 Fieldfare (Oct.-May)
- 53 Kestrel (Oct.-Mar.)
- 54 Woodcock (Sept.-Apr.)
- 55 Wood Pigeon (Sept.-Apr.)
- 56 Curlew (Sept.-Apr.)
- 57 Pochard (Sept.-Apr.)



Miguel was proclaimed king June 30, 1828, but was compelled to leave Portugal by the convention of Evora Monte, May 26, 1834. He found refuge in Rome. He married in 1851 Princess Adelaide of Lowenstein-Wertheim-Rosenberg, and he died Nov. 14, 1866.

Mihailoff, IVAN. A Bulgarian revolutionary. As leader of the Macedonian revolutionary organization I.M.R.O., he was forced to flee the country in 1934, and in 1935 was sentenced to death in absentia for his part in the murder of seven councillors in Krupnik in 1933. He returned to Bulgaria under an amnesty, May 23, 1941.

Mihailovitch OR MIKHAILOVITCH, DRAZA (1893-1946). Yugoslav soldier. Born in the village



Draza Mihailovitch, Yugoslav soldier, as he was in 1941 (left) and at his trial at Belgrade, June, 1946 (right)

of Shumadiza, he fought in the Balkan War of 1912-13 and in the First Great War, serving in Salonica and being decorated for bravery. When the Germans overran Yugoslavia in 1941, Gen. Mihailovitch took to the mountains, and there raised the Chetniks (*q.v.*), guerrilla bands which caused so much trouble to the Germans that they offered a reward for his capture. The Allies supplied him with money and equipment, and in Jan., 1942, he was appointed minister of war in the exiled Yugoslav government. His intense Serbian nationalism, however, alienated a great number of his supporters, and caused frequent clashes with the partisans under Tito, who accused him of having signed an agreement with the Germans and of using his Chetniks for his own political ends. In May, 1944, Allied support was withdrawn from him. After the defeat of Germany, Mihailovitch took refuge in the mountains, but was captured, Mar. 13, 1946, brought to trial in June, condemned to death as a collaborator July 15, and shot, July 17, 1946.

Mikado (Jap., exalted gateway). Title used by Europeans, but seldom by the Japanese, for the emperor of Japan. His own subjects called him *tenshi* (son of

heaven) or *tennō* (heavenly king). Japanese history claimed divinity for the mikados through their descent in the direct line from Jimmu, a descendant of the sun goddess, who ascended the throne in 660 B.C.; but the reigns of the monarchs before A.D. 712 were largely mythical. Seven of the mikados were women. On Dec. 31, 1945, the emperor Hirohito (*q.v.*), 124th of his line, issued an imperial rescript expressly repudiating his divinity; and on Mar. 6, 1946, a new constitution was drafted in which the position of the emperor as a constitutional monarch was defined, the phrase "sacred and inviolable" being eliminated. See Japan.

Mikado, THE, OR THE TOWN OF TITIPU. Comic opera by Gilbert, with music by Sullivan. It was produced at the Savoy Theatre, London, March 14, 1885, where it ran for 672 performances, and is still in the repertoire of the D'Oyly Carte company and a favourite among amateur operatic societies. The setting is mock-Japanese, the characters including the Mikado himself, Ko-Ko, the Lord High Executioner, and Pooh-Bah, Lord High Everything Else. Famous songs include Three Little Maids from School, A Wandering Minstrel, Tit-willow, The Flowers that Bloom in the Spring, and the Mikado's Song which includes the phrase, "to let the punishment fit the crime." For a time the play was withdrawn as a courtesy to visiting Japanese royalty. A screen version, 1939, marked the first filming of a Gilbert and Sullivan opera.

Mikania. Large genus of twining perennials of the family Compositae, natives chiefly of tropical America. They have opposite heart-shaped or oval leaves, and flower-heads consisting invariably of four florets only. One species, known as climbing hemp-weed (*M.*



Mikania. Foliage and flower spray of the climbing hemp-weed

scandens), occurs in the U.S.A. and Canada. The S. American *M. guaco*, with blue flowers, is believed to be the species to which chiefly the name of guaco is applied by the natives, who consider it an antidote for poisoning by snake-bite. The name commemorates Joseph G. Mikan (1743-1814), professor of botany at Prague.

Mikir. A primitive tribe of Tibeto-Burman stock. They are mostly in the Sibsagar, Nowgong and Khasi and Jaintia hills districts, Assam. Numbering some 100,000, all are animist, except a few hundred Hinduised and some Christian converts. Unwarlike peasantry, occupying pile-houses, they exhibit both Naga and Kuki Chin relationships.

Mikolajczyk, STANISLAW (b. 1901). Polish statesman. Son of an emigrant farm labourer, he was born at Gelsenkirchen, Germany, but returned as a child with his family to Poland. He was wounded in the Russo-Polish war of 1920, and later entered politics, becoming in 1937 president of the Peasant party, for which he sat in parliament 1930-35. He took part in the defence of Warsaw against the Germans, 1939, and fled to Hungary, where he was interned. Escaping to France he became the deputy president. When the Polish govt. left France in 1940 he came with it to London. Prime minister after Sikorski's death in 1943, he worked hard for Russo-Polish understanding, visiting Moscow twice before dissociating himself from the anti-Russian London govt. He returned to Warsaw, 1945, to become vice-premier in the new govt., but found himself out of sympathy and by 1947 was in opposition. His party being subjected to persecution, he escaped to England to join his wife who had remained there, was banished for life, declared a traitor, and deprived of his nationality by the Polish parliament.

Mikulov. Town of Czechoslovakia. In Moravia, it stands at the foot of the Polau Mts., 52 m. S. of Brno. The chief building is a castle, long the residence of the family of Dietrichstein. It has also churches, synagogues, and a monument to Joseph II. Near is the holyhill, on which are a church and many chapels. The industries are vine-growing and cloth-making. In July, 1866, the preliminary treaty between the Prussians and the Austrians was signed here. Nikolsberg is the old German name of this place, which was annexed by the Nazis in 1938.

Milan. Former duchy of Italy. The title duke of Milan was first granted by the Emperor Wenceslaus to Gian Galeazzo Visconti (*q.v.*) in 1385. Under him the territory of the duchy embraced Pisa, Bologna, Perugia, and Spoleto. On the death of his son Filippo Maria, 1447, a republic was proclaimed, but in 1450 Francesco Sforza seized power, and for eighty years, with intervals, the Sforzas held the duchy. The most famous of the Sforzas was Lodovico il Moro, who invited Charles VIII of France to enter Italy, ostensibly for the purpose of waging war against Naples. In 1500 Lodovico was deposed by the French who held the city for twelve years, Lodovico being taken prisoner to France. His son Massimiliano, restored in 1512, handed the duchy to the French three years later.

The victory of Charles V of Spain at Bicocca near Milan ousted the French from the city, and Lodovico's son Francesco was installed. On his death, in 1535, the city and the duchy were given by Charles V to Philip, afterwards Philip II of Spain. The duchy of Milan thus became an appanage of the Spanish crown. But in 1713 it was handed over to the Aus-

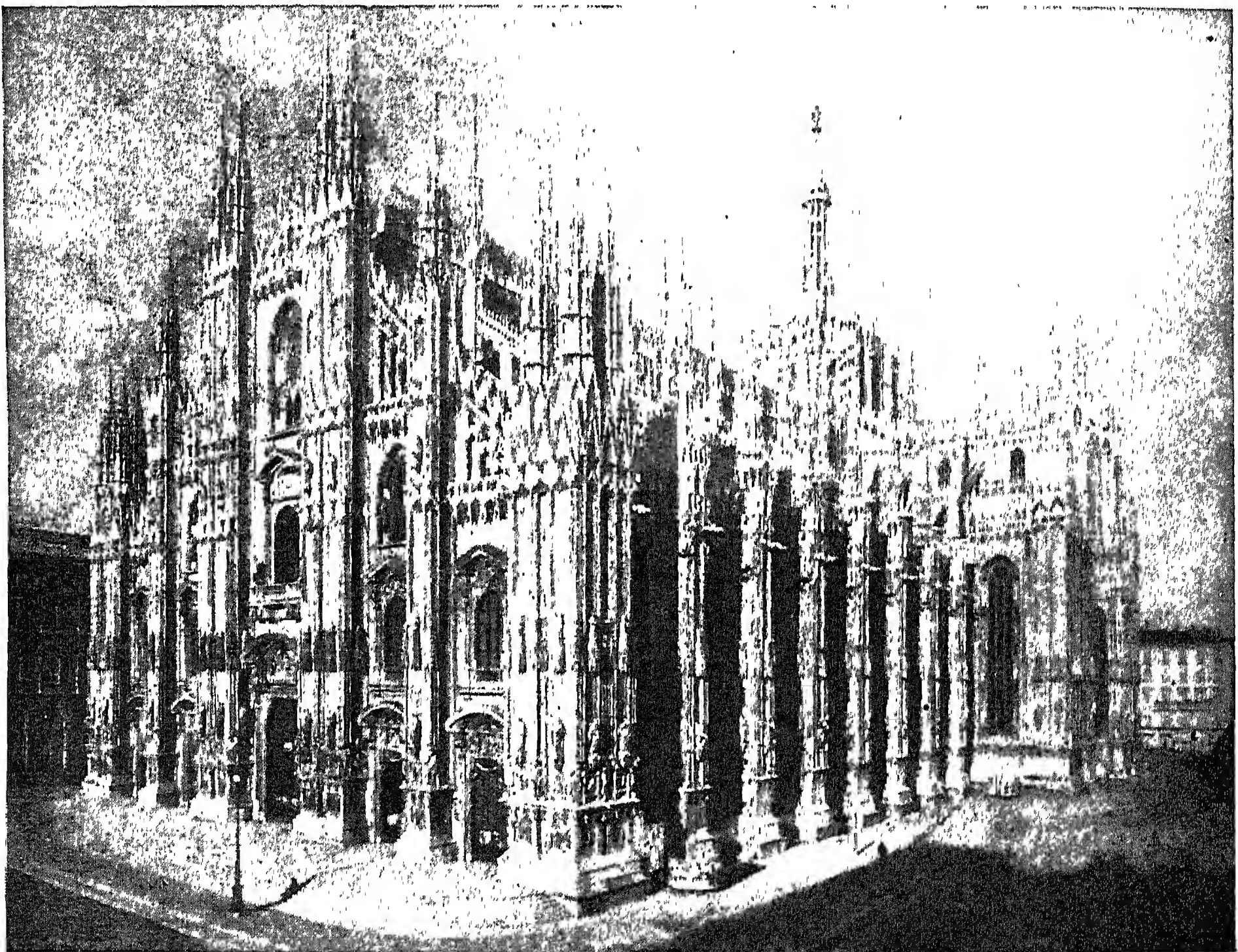
trians, and Austrian it remained until Napoleon's invasion in 1796, when it became first the Cisalpine Republic and later part of Napoleon's kingdom of Italy, 1805-14, reverting once more to Austria after Napoleon's fall. It passed to the newly proclaimed kingdom of Italy in 1859.

Milan (It. Milano). Province of Italy, in Lombardy. It is the prov. with the largest number of towns (245), and, fourth largest prov. of Lombardy, is the most densely populated (pop., 1951, 2,500,115). Area 1,056 sq. m. It comprises the largest part of the plain of Lombardy, and lies between the rivers Ticino on the W., Adda on the E., and Po on the S., while on the N. it is separated by hills from the adjoining provs. of Como and Varese. The seat of great industries (textiles, iron, rubber, tools and machinery, chemicals, etc.), the prov. of Milan represents an important factor in the economic life of Italy.

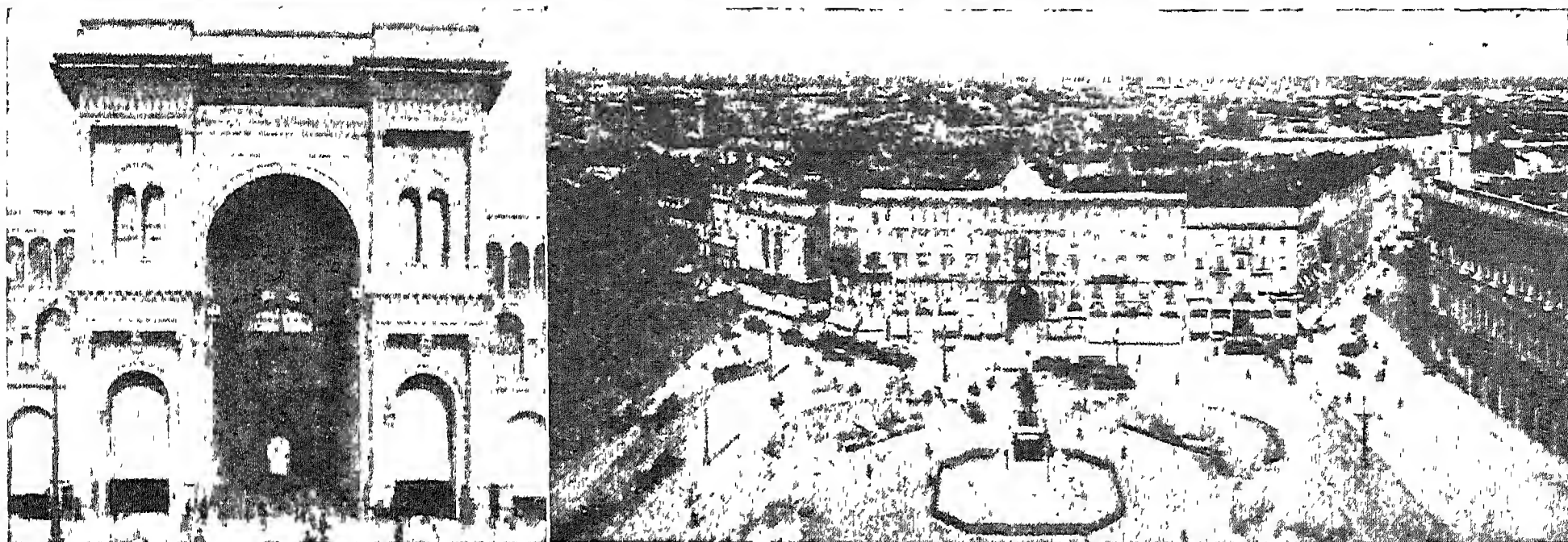
Milan (It. Milano). City of N. Italy, capital of the prov. of Milan, in Lombardy. The ancient Mediolanum, Milan derives its importance from its geographical situation, for it stands almost at the centre of the great plain of the Po

valley, E.N.E. of Turin. On Milan converge the great rly. lines and roads that cross N. Italy and connect the Danubian countries with the Rhône basin of France, and Switzerland and Germany with the Mediterranean ports of Genoa and Venice and with the S. of Italy. The three rivers of the prov., Po, Ticino, and Adda, feed several canals, in particular the Naviglio Grande, which partly encircles the city and divides it into two unequal parts. In the centre of the town the canal has been covered.

Milan is the chief financial centre and the richest commercial and industrial city of Italy. The climate is typically continental, very hot in summer and very cold in winter, with abundant snowfalls between Dec. and Feb. The city underwent great expansion during the early 1930s, but its ancient monuments, many of them very fine, were preserved. The most famous is the magnificent cathedral, or duomo, dedicated to the Virgin, which fortunately suffered only minor damage during the Second Great War. It stands in the very centre of the city, and, begun by order of Gian Galeazzo Visconti in 1386, it was conse-



Milan. West front of the cathedral, a superb example of Gothic architecture, seen from the Piazza del Duomo



Milan. Left, entrance to the Galleria Vittorio Emanuele, from the Piazza del Duomo. Right, view of the city, looking north from the roof of the cathedral

crated in 1577 and actually completed by order of Napoleon, 1805-15. This superb specimen of "decorated Gothic" architecture is the work of a series of ancient architects: the name of its first designer is unknown, but the books of the chapter include the names of Andrea degli Organi of Modena, Guglielmo di Marco, Simone da Orsenigo, the German John of Fernach, and the French Jean Mignot of Paris. Faced with white marble, it is one of the most sumptuous churches in the world, with five naves, covering an area of 14,000 sq. yds., and accommodating 40,000 persons. In a splendid crypt is the tomb of S. Charles Borromeo. S. Ambrogio, founded by S. Ambrose in the 4th century, and containing his tomb, suffered badly in 1943; a Roman basilica, it was virtually rebuilt in the 12th century and later restored. Its lofty brick campanile, c. 800, is one of the earliest in Italy. Here the Lombard kings and later Roman emperors were crowned with the famous iron crown preserved at Monza (*q.v.*). The abbey church of S. Maria delle Grazie (1463) was severely damaged by air raids, 1943, though the dome remained intact. The cloister was almost entirely demolished. Leonardo da Vinci's celebrated painting, *The Last Supper*, on one wall of the refectory, remained in satisfactory condition, although the wall opposite it and the roof collapsed.

There are many other old churches, museums, picture galleries, hospitals, an academy, library, observatory, monuments, and scientific, musical, artistic, educational, and philanthropic institutions, most of which escaped uninjured, but some of which were severely, some lightly damaged. Prominent among the many fine palaces is the Palazzo della Ragione, in the centre of the

medieval city, built of brick, 1223-38. Near it is the beautiful Loggia degli Osii, 1316, in black and white marble. The beautiful Brera palace, 1651, was severely damaged, though the collection of paintings, one of the finest in Italy, together with the library of 300,000 rare volumes and 60,000 coins, had been put in safety. The Castle of the Sforza was also severely damaged.

The massive walls enclosing the inner city were destroyed long ago, and their site is occupied by promenades. The outer circle of walls, built by the Spaniards in the 16th century, is almost intact. On the N.W. side the line is broken by the handsome park; to the N.E. within the walls are the public gardens, reputed the

most beautiful in Italy, with their old trees, ponds, statues, and royal villa. Between them and the Piazza del Duomo, adorned with a handsome equestrian statue of King Victor Emmanuel II, runs the Corso, named after that king. Out of the Piazza del Duomo opened the famous Galleria Vittorio Emanuele, a great glass-roofed arcade, with a cupola 160 ft. high, which was virtually wrecked by air attack.

Milan is the centre of the Italian silk trade; other important industries include the manufacture of tires, motor-cars, machinery, aircraft, locomotives, instruments, metal bridges and roofing, dynamos, and electric fans, bicycles, electric cables and accessories, textiles, and furniture. The city



Milan. Plan of the central districts of this great commercial and industrial city of N. Italy

is also Italy's most important publishing centre, and a seat of culture and of music. Here is the world famous Scala opera house, founded 1778, and the Ambrosian library. Pop. (1951) 1,272,934

Milan was the seat of government of the Western emperors from Maximian, A.D. 286, until its sack by the Huns in 452. Taken by the Goths in 493, it became Theodoric's capital, but was nearly destroyed by the Goths as a reprisal for a revolt in 539. Rebuilt in the 12th century, Milan was one of the greatest of the city-republics which fought against Frederick Barbarossa. Subsequently it became the capital of a duchy ruled by the families of Visconti and Sforza. From 1805 to 1814 it was the capital of the kingdom of Italy created by Napoleon. Reoccupied by the Austrians after Napoleon's defeat, Milan and all Lombardy were freed after the battle of Solferino by King Victor Emmanuel II and his temporary ally Napoleon III; by the treaty of Villafranca, July 11, 1859, the Austrian emperor resigned all claim to the prov., which, with the city, became merged in the kingdom of Italy.

During the Second Great War Milan was attacked by the Allies from the air a number of times, the worst raids occurring Aug. 13-16, 1943, after which the city burned for a week. Indications of some of the damage suffered by famous buildings are given above; only five of the 27 churches scheduled as protected monuments escaped injury. After the Italo-Allied armistice of Sept., 1943, unrest among the people of Milan caused the Germans to proclaim a state of emergency there, seize 1,750 hostages, mount machine-guns, and bring in tanks to prevent a rising. Partisans liberated the city from German and fascist troops, April 25-27, 1945, before the arrival of the Allies. The bodies of Mussolini and his mistress Clara Petacci, executed at Dongo, Lake Como, April 28, were brought to Milan and hung head downwards in the Piazza Loreto. See Italy; Sforza; Visconti.

Milan Obrenovitch (1854-1901). King of Serbia. He was born at Jassy, Aug. 22, 1854, and became prince of Serbia on the assassination of his cousin in 1868. In 1882 he made his principality an independent kingdom. His adherence to Austria having alienated his subjects, he abdicated in 1889 in favour of his son Alexander and settled in Paris, where

he remained until 1894. In that year he returned to Serbia and became adviser to his son, and a power behind the throne. He was given command of the army in 1898 and put the service on a sound footing. Milan's quarrel with Alexander over the latter's marriage, 1900, led to his resignation. He was banished from Serbia and retired to Vienna, where he died Feb. 11, 1901.

Milazzo. Seaport of Sicily, in the prov. of Messina. The ancient Mylae, it stands on the N.E. coast, 22 m. by rly. W. of Messina. It has a commodious harbour, and its chief exports are tunny, sulphur, oil, wine, fruit, and cattle. The castle, built by Charles V and restored in the 17th century, is now a prison. In the vicinity are sulphur springs. Mylae was an outpost of Zancle in the 7th cent. B.C., and in its bay the Romans won their first naval victory over the Carthaginians in 260 B.C. Here Garibaldi defeated the Neapolitans on July 20, 1860. On Aug. 15, 1943, the Allies captured Milazzo from the Germans, who had been using it to evacuate their forces to the Italian mainland. Pop. (1951) 21,513.

Milch, ERHARD (b. 1892). German air force officer. Born at Königsberg, he was educated at the university there and at the Danzig technical high school. Commissioned in the army in 1912, he transferred in 1915 to the flying corps, in which he served as a pilot until 1918. He became an airline pilot in 1920 and by 1926 was a leader of civil aviation. An early supporter of Nazism, he was made secretary of state for air by Hitler in 1933 and was responsible for building up the Luftwaffe, contrary to the terms of the Versailles Treaty. In 1938 he was appointed chief of the air staff and chairman of the Lufthansa. He was inspector-general of the Luftwaffe, 1939-44, acting as deputy to Goering. Arrested by the Allies in June, 1945, he was tried as a war criminal, the principal charges against him being participation in the slave-labour programme and initiation of the freezing tests on concentration camp inmates by the Luftwaffe. Sentenced to life imprisonment, April 17, 1947, reduced, 1951, by the U.S. authorities in Germany to 15 years, he was released July 1, 1954, for good conduct.

Mildenhall. Market town of Suffolk. It stands on the Lark, 12 m. from Bury St. Edmunds and 76 m. from London, with a rly. station. The chief building is S.

Andrew's church, mainly Perpendicular, famous especially for its tower, chancel, and roof. There is a market cross of the 15th cent.; a 17th cent. manor house was pulled down in 1934. It is an agricultural centre, milling being an industry. Roman remains have been found near by. In 1942 a farmer ploughing a field at West Row, near Mildenhall, unearthed a valuable collection of third century Roman silverware. Many of the articles, which were in an excellent state of preservation, are now in the British Museum. An R.A.F. station at Mildenhall was opened in 1934. It was a bomber station in the Second Great War. Market day, Fri. Pop. 3,235.

Mildew. Popular term of such loose application that it has little descriptive value, including as it does such diverse fungi as moulds, rusts, cluster-cups, and powdery mildews. Properly used, it should be restricted to the last named, the external blights of the order Erysiphace, whose mycelial threads form a cobweb-like patch on the surface of leaves and shoots, whilst their suckers attack the superficial cells. Well-known examples that may be cited are the vine mildew (*Plasmopara viticola*), pea mildew (*E. polygoni*), hop mildew (*Sphaerotheca humuli*), and rose mildew (*S. pannosa*). The last named, from its frequent occurrence on garden roses, is the most familiar.

The mealy appearance of the white patches on the leaves and stems of the rose is due to the presence of multitudes of microscopic summer spores (*conidia*), which are dispersed by the wind, insects, etc., and infect other roses. In the autumn the same patches will be found to be studded by larger black dots (*perithecia*), which remain until the spring, when the integument breaks up and releases the contained spores which, on dispersal by the wind, infect the new shoots and unfolding leaves. The abstraction of nutriment from the leaf-cells produces starvation and withering of the plant. Flowers of sulphur dusted on the patches, or the same boiled in water with an equal weight of quicklime and the clear liquor sprayed, stops the attack. See Fungus; Phycomycetes; Spore.

Mild Steel. A generic term applied to all steels of low carbon content. No sharp division can be made between mild steels and medium carbon steels, but as a rule a steel is called mild if the carbon content does not exceed 0.3 p.c.

Similarly a high carbon steel is one containing more than 0.6 p.c. The lowest carbon steels are used for wire and rails for electrical conductors, while the steels ranging from 0.07 to 0.15 p.c. carbon are the most widely produced of all. These are made into rods and wire for many uses, e.g. nails, rivets, bars for ferro-concrete. Both these steels are usually made with some residual oxygen left in the steel; during cooling this reacts with carbon giving carbon monoxide gas bubbles which increase the volume of the ingot and reduce the pipe. Ordinary mild steels, containing 0.15 to 0.25 p.c. of carbon, may be used for deep forging, case-hardening, sections for joists, channels, and angles.

Mildura. Town in Victoria, Australia. It is 351 m. N.W. of Melbourne and is the centre of the irrigation scheme on the Murray river, on which the state spent £3,000,000 in dealing with 150,000 acres. Mildura has fruit packing and preserving factories. Pop. (1954) 10,971.

Mile. Measure of distance. As first used by the Romans it was approximately 1,617 yards. The British statute mile, legalised in 1593, is 1,760 yards. The mile has varied considerably: e.g. the old Scottish mile was 1,984 yards; the Irish 2,240 yards; the old London mile 1,666 yards. The old English mile consisted of ten furlongs; and a mile equalling a little over $1\frac{1}{2}$ present-day miles was extensively used in the N. of England and in Wales till the 16th century. The nautical mile, equal to 1 minute of latitude, is 6,082.66 ft. The Admiralty mile is 6,080 ft.

Mile End. A district of E. London. Once a hamlet of Stepney parish, it now forms the central and N.E. parts of Stepney bor. Through it runs Mile End Road, probably the broadest thoroughfare in London, connecting Whitechapel Road and Bow Road. Part of the district between Commercial Road East and Mile End Road is called Mile End Old Town. Notable buildings include Trinity Hospital, 1695, almshouses for master mariners and mates and their wives or widows; the Vintners' almshouses, 1676, rebuilt 1802, but almost entirely destroyed during the Second Great War: the People's Palace, opened 1887, destroyed by fire, 1931, but rebuilt, 1936; Queen Mary College of the University of London; the Great Assembly Hall, associated with the work of F. N. Charrington; the Old Town

Workhouse, and S. Benet's church, rendered derelict by war damage. In the Jews' Burial Ground, closed 1858, are the graves of Lord Beaconsfield's grandfather, Benjamin D'Israeli, and Baron Nathan Rothschild. Captain Cook, the navigator, lived in Mile End Road. At Mile End Green, now Stepney Green, Wat Tyler assembled his followers for the attack on London. Mile End is said to have been named from the fact that it begins a mile from the old city wall at Aldgate.

Miles, EUSTACE HAMILTON (1868–1948). British athlete and food reformer. Born at Hampstead.



Eustace Miles, British food reformer

Sept. 22, 1868, he was educated at Marlborough and King's College, Cambridge. He won the amateur championships at tennis, rackets, and squash in America in 1900, and was amateur tennis champion of England, 1898–1903, 1905–06, and 1909–10. The world championship at rackets fell to him in 1902, and that at tennis in 1898–1903 and 1905. A vegetarian, Miles wrote on health and food reform, and founded restaurants and food companies to further his theories. He died Dec. 20, 1948.

Milesian. Legendary name of an early Irish people. It is a latinised form of Miled, perhaps an equivalent of Celtic *gulam*, or warrior. Tall, fair-haired, blue-eyed Goidelic Celts, the Milesians mingled with and subdued the earlier population. One tribe, the Scots, whose name was given in Latin annals to the whole people, migrated to northern Albion (Scotland).

Miles Platting. A suburb of Manchester, England. It comprises the eccles. dists. of S. John and S. Luke, and has a rly. station $1\frac{1}{2}$ m. N.E. of Victoria, Manchester. Pop. 14,000.

Milestone (Lat. *lapis miliaris*). Post of stone, metal, or wood set up to mark distances along roads. Inscribed pillars at equal distances of 1,000 *passus*—equivalent to 1,617 English yds.—marked distances on Roman military roads throughout the Empire. Augustus built in the forum at Rome a bronze-gilt pillar, *aureum miliarium*, or golden milestone, upon which were inscribed the names and distances of the chief towns on

roads leading out of the 37 gates.

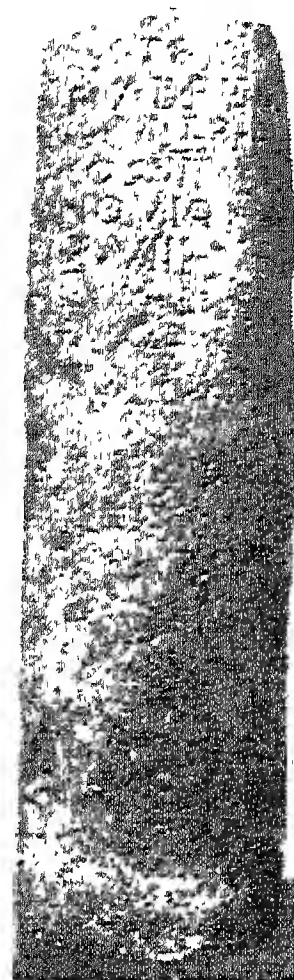
When the Romans cut their great military ways across Britain, distances were marked by cylindrical shafts 6 ft. high. One set up in the 4th cent. is on the road between Carlisle and Corbridge-on-Tyne, and is the oldest standing milestone in Britain. Another set up at Castleford c. A.D. 50, is now in a museum at York. Roman mile-stones bore, in addition to the distance from the nearest town, the name and titles

of the emperor under whom they were set up. They sometimes also gave the name of the officer responsible for the work. In the museum at Chesters, Northumberland, are milestones recording roads built from the time of Severus Alexander to that of Constantine. After the withdrawal of the Romans, no more milestones were set up in Britain until after the Norman conquest. There is a Norman example on Castleton Ridge, near Hutton-le-Hole, Yorks.

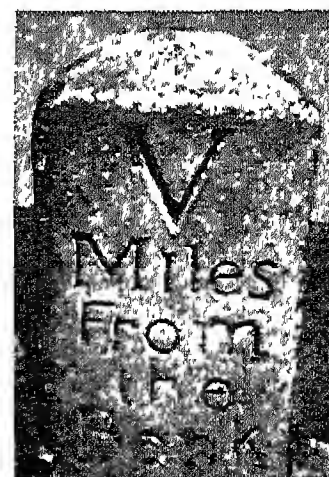
Medieval milestones in Britain were set up by private persons either for publicity or out of philanthropy. Measurements were always to local standard, and the mile varied from county to county. In 1593 the mile (*q.v.*) was standardised at its present length, and milestones were set up on most roads, though on a local and voluntary basis.

In 1698 it became obligatory upon the turnpike trustees to mark with a stone every mile of road upon which they levied tolls. This responsibility was

transferred to local authorities and parishes in 1773. Many mile-stones in Sussex were of wood, in Lancashire of iron. Holes in some milestones on lonely moorland roads were drilled by high-



Roman milestone



Milestone, Clapham Common, London

waymen, according to tradition, to enable them to watch for victims. When stage coach services began in England, the operators were obliged to base their fares by distance according to milestones, and this obligation was inherited by the railways. By the General Highways Act of 1835, local authorities ceased to be responsible for milestones. By Defence Regulation of July 19, 1940, local authorities were required to remove all milestones for the duration of the Second Great War, as their presence might have assisted German parachute troops and enemy agents. Most were restored after the war.

Milestones. Play by Arnold Bennett and Edward Knoblock, first produced at the Royalty Theatre, London, March 5, 1912, with Dennis Eadie in the chief part of John Rhead. It presents an English middle-class family at three periods of emotional domestic crisis involving three generations, in the years 1861, 1885, and 1912. The picture of social changes through fifty years and the accuracy of its period detail are as characteristic of the play as its observation of the more fundamental changes which increasing age may work upon individual characters. The play has been revived several times in the West End as well as remaining popular with repertory and amateur companies; and has gained in piquancy by the fact that the 1912 scene, originally contemporary, has itself become increasingly "period."

Miletus. Ancient city of Asia Minor. Standing on the Gulf of

Latmos, near the mouth of the Maeander, it was the chief town of the Ionian colonies of Greece. A great commercial city, it was famous for its woollen goods, traded with the whole Mediterranean coast, and established many colonies in the Propontis and Euxine, as well as Nauclatis in Egypt. Taken by Croesus, and in 557 B.C. by the Persians, it headed the great Ionian revolt against Persia, but was destroyed on its suppression in 494 B.C. Captured by Alexander, it passed to the kingdom of Pergamum, and to Rome. The birthplace of Thales and other Greek writers, it is poorly represented by the modern Palatia.

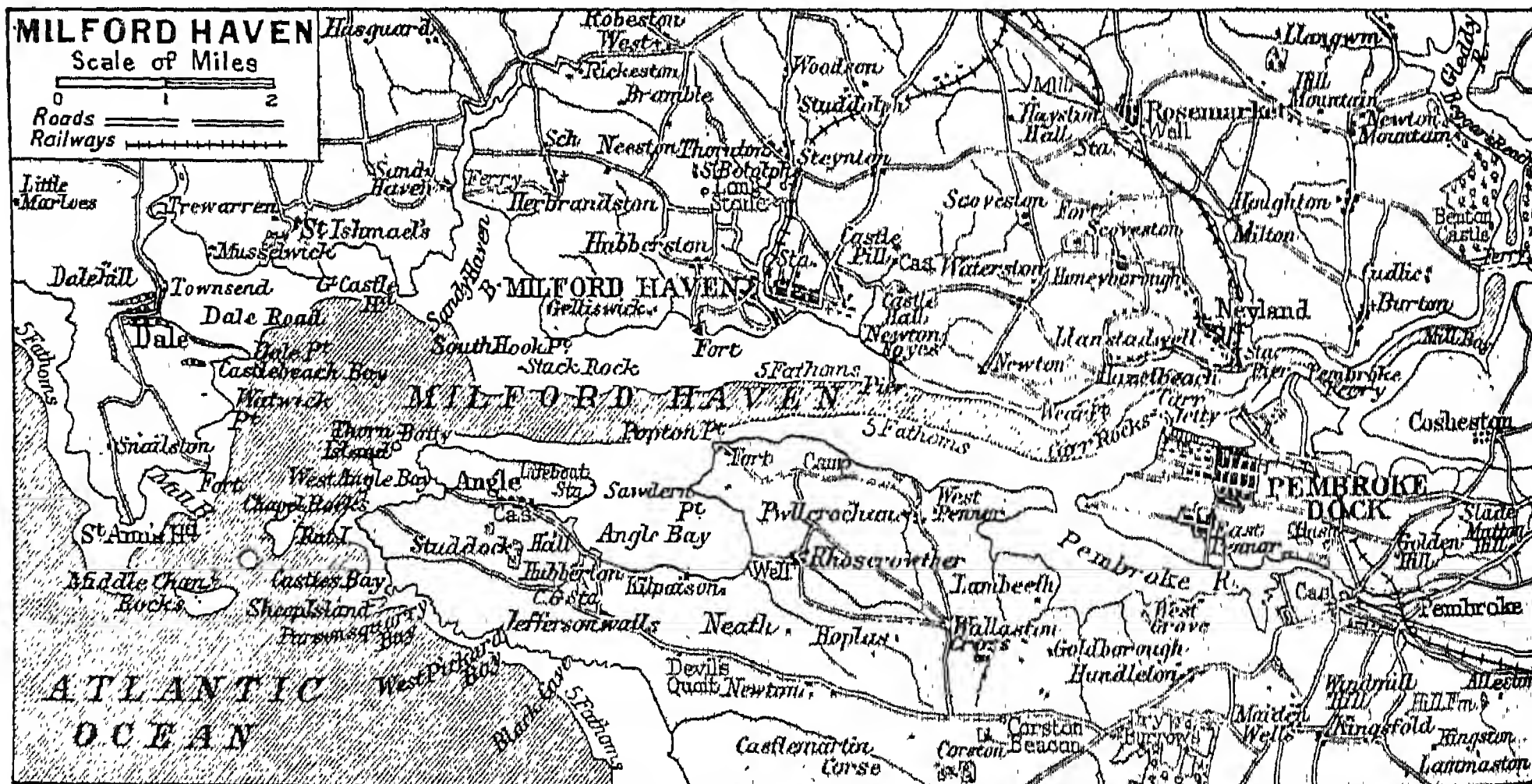
Milford. Town of New Haven co., Connecticut, U.S.A. Situated at the mouth of the Housatonic r., on the Wepawaug r., and Long Island Sound, 9 m. S.W. of New Haven, it is served by rly. A township, retaining the historic New England form of town government, it has produced oysters, clams, and other shellfish since the 17th century. Manufactures include electric motors, automobile and boat equipment, rivets and other small metal objects, and synthetic rubber products. It was settled as a "church-state" community in 1639, incorporated as a town, 1640. Pop. (1950) 26,870.

Milford, SIR HUMPHREY SUMNER (1877-1952). British publisher. Born Feb. 8, 1877, educated at Winchester and New College, Oxford, in 1900 he joined the Clarendon Press. In 1913 he became publisher to Oxford University, a post he held until his retirement in 1945. During 1919-21 he

was president of the Publishers' Association of Great Britain and Ireland. In 1936 he was knighted. Sir Humphrey was joint editor of the Oxford Book of Regency Verse; originated the Oxford Dictionary of Quotations; edited the works of Borrow, Clough, Cowper, Leigh Hunt. He died Sept. 6, 1952.

Milford Haven. Opening of the Atlantic Ocean. On the coast of Pembrokeshire, it is regarded as the finest natural harbour in England and Wales. It extends inland for 17 m., being from one to two miles broad. The port called Milford Haven is on the N. side, and on an inlet on the S. is the royal dockyard of Pembroke Dock. The estuary of the E. and W. Cleddy rivers, the haven is called in Welsh Aberdaugleddau. Its position and safety made it in the Middle Ages the chief harbour for intercourse with Ireland. Fortified by Elizabeth I, and in modern fashion in the 19th century, it was a flying-boat base during the Second Great War.

Milford Haven. Seaport and urban district of Pembrokeshire, Wales. It stands on the N. shore of the inlet called Milford Haven, some 7 m. S.S.W. of Haverfordwest. It has sheltered docks, 5 m. inland from the mouth of the estuary of Milford Haven; good yachting facilities are available. A fishing and commercial port founded by Quakers from Nantucket, U.S.A., it has become a major petroleum port. Earthwork and other antiquities abound in the neighbourhood, and relics of Nelson are housed in S. Katharine's Church. Pop. (1951) 11,710.



Milford Haven, Pembrokeshire. Map of the natural harbour in South Wales, showing the position upon it of the towns of Pembroke Dock and Milford Haven

Milford Haven, 1st MARQUESS OF. British politician. Louis Alexander (1854–1921), son of



1st Marquess of
Milford Haven
Russell

Prince Alexander of Hesse, was born at Graz, May 24, 1854, became a naturalised British subject on entering the navy in 1868, and married a grand-daughter of Queen Victoria. Changing his German name of Battenberg to the English equivalent, Mountbatten, in 1917, he was created marquess of Milford Haven. He was director of naval intelligence 1902–05, and commanded the Atlantic fleet 1908–12. Then he became first sea lord, retiring in view of the anti-German feeling against him soon after the outbreak of the First Great War in 1914. He died Sept. 11, 1921. A Life by M. Kerr appeared in 1934.

His grandson, David Michael Mountbatten, 3rd marquess (b. May 12, 1919), succeeded to the title in 1938, was educated at Dartmouth, and served in the Second Great War.

Milford-on-Sea. A town of Hants, England. A small seaside resort on the coast between Christchurch Bay and the Solent, it is 3 m. S.W. of Lymington and 4 m. N. of the Needles. Of unusual design are the 13th-century tower and steeple of All Saints' church. Hurst Castle, 2½ m. to S.E., was erected by Henry VIII to guard the entrance to the Solent; Charles I was confined here on his way from the Isle of Wight to the scaffold at Whitehall, Jan., 1649.

Milford Sound. Fiord in the S.W. of South Island, New Zealand, in Lake co., 217 m. N. of Bluff by sea, reached overland from Lake Te Anau. Mitre Peak, 5,560 ft., and Tutoko, 9,042 ft., rise sheer from the water. The sound forms part of a national reserve, comprising also the neighbouring fiords and covering 3,125 sq. m. of magnificent scenery including Sutherland Falls, 1,904 ft. high, and Lake Ada. A motor road to Milford Sound, formerly to be reached only by a 21-m. walk through bush and mountains, was opened in 1955.

Milhaud, DARIUS (b. 1892). French composer. Born at Provence, Sept. 4, 1892, he studied at the Paris conservatoire, and after the First Great War was a member of the group known as Les Six. He displayed remarkable gifts both as

satirist and as tragedian. His incidental music to Greek drama reached a climax in his "orchestration of stage noises" in the music to the Choëphori of Aeschylus. In *Le Boeuf sur le Toit*, 1919, he exploited the humorous possibilities of the Brazilian tango, and parodied musical comedy conventions in the ballet *Le Train Bleu*, 1924. Many of his humorous works created sensations, e.g. the setting of a florist's catalogue for voice and chamber orchestra. His later works included a number of string quartets, songs, sonatas, and the *Cortège Funèbre*. Notes Without Music, an English translation of Milhaud's autobiography, appeared in 1952.



Darius Milhaud,
French composer

Military Academy, ROYAL. Title of the training college maintained at Sandhurst (*q.v.*) by the British War Office for the instruction of cadets before they are commissioned in the Army. Until 1939 the title was borne by the training institution at Woolwich (*q.v.*). From 1946 cadets for all branches of the army were trained at Sandhurst. The corresponding R.A.F. college is at Cranwell and that of the Royal Navy at Dartmouth.

Military Band. Combination of wind and percussion instruments used for military purposes, though the term is also generally applied to any similar civilian combination.

In Great Britain there is no fixed standard, but a large military band may contain 2 piccolos and 2 flutes in E flat or D flat, 4 hautboys, 2 E flat clarinets, 8 1st, 6 2nd and 4 3rd B flat clarinets, 1 alto clarinet in E flat, 4 saxophones in E flat and B flat, 4 bassoons, 1 double bassoon, 6 1st and 4 2nd cornets in B flat, 2 trumpets in E flat or B flat, 4 horns in E flat or F, 2 flügelhorns in B flat, 2 baritones in B flat, 2 euphoniums in B flat or C, 2 or 3 tenor trombones in B flat, 1 bass trombone, 5 bombardons in E flat and B flat, 2 string basses, kettle drums, side drums, bass drum, cymbals, triangles, bells, glockenspiel, etc.

Military Cross. British military decoration for gallantry. Instituted on Dec. 31, 1914, as a reward for officers of the rank of captain and below and for warrant officers. It can be awarded to officers and warrant officers of the

R.A.F. for gallant services on the ground, as distinct from flying. It also can be awarded to naval officers attached to military formations. Warrant officers awarded the M.C. are eligible for a gratuity of £20 on promotion to a commission, on transfer to the reserve, or on discharge without pension. If discharged with pension, they are eligible for an additional sixpence a day. The decoration is a silver cross bearing the royal cypher in the centre and the imperial crown at the end of each limb. It is suspended from a white ribbon with a central stripe of purple and is worn immediately after the D.S.O. Over 40,000 Military Crosses were awarded in the First Great War and 11,000 in the Second Great War. (See Medals colour plate.)

Belgium has a Military Cross which was instituted in 1885 and is awarded to officers who have served 25 years in the army. The Greek Military Cross was instituted by Venizelos in 1917 to reward gallantry in the field by Greek Nationalist troops, but is now more or less complimentary. The Czechoslovak Military Cross for gallantry was instituted in 1939.

Military Engineering, THE SCHOOL OF. A British military training centre, official headquarters of tuition in engineering for the army. The school is at Ripon, Yorks, with a wing at Chatham, Kent. There officers and men of the Royal Engineers (*q.v.*) undergo courses of instruction up to two years. The syllabus includes courses in fortification, surveying, building construction, general science, and the maintenance of refrigerating, mechanical, and electrical equipment. Special courses are given in field engineering, bridging, and in preparing officers for university engineering examinations. The school's head is a general officer known as commandant.

Military Knights of Windsor. Body of retired military officers, forming part of the order of the Garter (*q.v.*). When Edward III instituted the order in 1349 with 26 companions, he included in the foundation an equal number of canons and of veteran knights. The latter, known as Poor Knights, because wounds or other misfortune made them unable to support themselves suitably, he endowed with an annual income and allotted quarters in Windsor Castle. Elizabeth reduced their number to 13 and re-endowed them.

In the reign of Charles I five more knights were added on a

lower foundation. In 1919 an Act of Parliament was passed, decreeing that no further appointments should be made to the lower foundation, which will be absorbed, so that in future the knights will again number 13. One of them is governor of the rest, and he is given the rank of major-general if he does not already hold it. Appointments are made by the sovereign, and the knights are under the orders of the governor of Windsor Castle. They have residences in the castle and a small annual stipend. They are the oldest military brotherhood in existence, and the only military body in England entitled to wear the national badge of S. George.

Military Law. The code of law to which a person becomes subject on joining the British army. It is contained in the Army Act, the king's regulations, royal warrants, army orders, and army council instructions. There are similar codes for the Royal Navy and Royal Air Force in the Naval Discipline Act and Air Force Act.

Military Medal. British military award for gallantry. Instituted in March, 1916, it may be conferred on warrant officers, n.c.o.s, and men of the army; non-commissioned ranks of the women's auxiliary services; and upon warrant and non-commissioned personnel of the R.A.F. for gallantry on non-flying duties. The medal, of silver, has on the obverse the royal effigy and on the reverse the inscription For Bravery in the Field, surrounded by a wreath and surmounted by the royal cipher and crown. It is suspended from a dark blue ribbon having three white and two crimson stripes. Some 60,000 Military Medals were awarded in the First Great War and approximately 11,000 in the Second Great War. (See Medals colour plate).

The French award a military medal for gallantry by native troops in the colonial army. It is distinct from the Médaille Militaire (*q.v.*). The Belgian Military Medal was instituted in 1902 for n.c.o.s and men of the army.

Military Police. Corps of the army detailed to enforce discipline and bearing, to maintain law and order among soldiers, and to perform also many of the same functions as do the civil police among the civil population. From the reign of Henry VIII there had been attached to the British army a civilian corps called Provost Marshals (*q.v.*), who were responsible for controlling the numerous camp followers. Gradually their

work became more and more associated with the troops, until eventually military police duties were undertaken by pickets, which were composed of ordinary soldiers detailed from their units and temporarily invested with police authority for a specified period of duty, usually 24 hours. This practice still exists in the form of regimental police, whose authority is confined to the particular camp, barracks, or regimental limits of their unit, and is restricted to ensuring that men walking out are correctly dressed and of good behaviour. The provost marshals became administrative officers responsible for the general supervision of soldiers' conduct.

In 1855 a corps of military foot police was established as the executive troops of the provost marshal and empowered to arrest any soldier not provided with a pass; to maintain order in garrison towns; to control military traffic both on the highway and on army lines of communication; to guard certain military installations; to prevent pilfering of military stores; and, in conjunction with the intelligence service, to apprehend spies. In 1877 a corps of military mounted police was established, and in 1926 the two corps were amalgamated.

As far as possible the enforcement by the Corps of Military Police of discipline and bearing of men off duty is done by example and checking. To that end a high standard of conduct, smartness, and integrity has become a corps tradition. Military police are recruited from men selected from other units or by direct enlistment who become n.c.o.s on probation.

At the outbreak of the Second Great War the Corps of Military Police had a strength of 3,500, but the mechanisation of the army necessitated a considerable reorganization. In 1940 three new branches were formed; C.M.P. (S.I.B.), special investigation branch, the "C.I.D." of the army; C.M.P. (T.C.), the traffic control companies; and the C.M.P. (V.P.) police for guarding vulnerable points. During the N. Africa campaigns traffic control companies were with the forward troops to mark tracks and direct armour and other traffic through the minefield gaps. Beach provost companies were formed for the N. African landings in 1942, and went ashore with the assault troops at Anzio and Salerno. All branches of the corps took part in the Normandy invasion in 1944 and

accompanied the army in every operation leading to the final German surrender. The corps was then charged with enforcing the regulations of the military government imposed in the occupied territories. At the end of the war the corps had a strength of 35,000 and had suffered heavy casualties. In 1946 a special army order announced that in recognition of their service the corps had been authorised by the king to use the prefix Royal.

Members of the corps wear red cap covers (hence their nickname "red caps") and a black armlet with the letters M.P. The Royal Navy and the Royal Air Force maintain their own corps of police.

Military School of Music, ROYAL. For the activities of this school for military bandsmen see under Kneller Hall.

Military Service Acts. Acts passed by the British government rendering British subjects liable to service in the armed forces. The first military service act was passed by the Asquith government in the First Great War, became effective on Feb. 10, 1916, and provided for the conscription of all single men aged between 18 and 40. Exemptions were made in favour of conscientious objectors, ministers of religion, and persons engaged in work of national importance. In June, a second act rendered all males between 18 and 41, except those exempted by the first act, liable for military service. The second act also retained in the army time-expired soldiers. On April 15, 1918, the heavy British casualties resulting from the German offensive led to a third act, raising the age of liability for service to 50. None of these acts applied to Ireland, and all lapsed with the signing of the peace treaty in 1919.

In March, 1919, a fourth act came into force to ensure drafts for the army of occupation in Germany. It gave the government power to extend until April 30, 1920, the compulsory service of any man already in the armed forces at the end of the war.

In 1939 a British Military Training Act rendered all men of 20 liable to serve in the army for six months followed by three and a half years in the Territorial Army. This act was replaced by the National Service, Armed Forces, Act of Sept. 1, 1939. It provided that every male British subject in Britain between 18 and 41 should, from time to time by proclamation, become liable for service in the

armed forces. Provision was made, however, for the exemption of persons engaged in a variety of occupations considered essential to the war effort. On Dec. 18, 1941, the National Service (No 2) Act was passed. This raised the age for compulsory military service for men from 41 to 51, while unmarried women between 18 and 31 became liable to serve in the uniformed auxiliary services of the crown.

Under a plan announced in June, 1946, men called up during 1947 served for two years, those during 1948 for progressively shorter periods down to 18 months for Dec. recruits. A new National Service Act, June, 1947 (effective 1949), reduced full-time service to one year, followed by 60 days' part-time training, in an auxiliary service, spread over six years; an amending Act, Nov., 1947, made full-time service 18 months. An Act of 1950 restored two years' full-time service. See National Service.

Militello-in-Val-di-Catania. Town of Sicily, in the prov. of Catania, 18 m. S.W. of Catania city. It carries on a trade in olive oil, wine, and silk. The town was destroyed by earthquake, 1693. Pop. (1951) 11,568.

Militia (Lat. *miles*, soldier). Civilians enrolled as an auxiliary military force and periodically embodied for instruction and drill. On the Continent, the name is frequently given to the second line troops of a national army, and personnel of the militia consists of reservists who have completed military training as conscripts. In Great Britain, the militia as it existed until 1908 was a constitutional force raised under the sanction of parliament for home defence and enlisted locally by cities or counties. It could be sent out of the country only if the men volunteered, and then only with the consent of parliament. In few instances had its personnel served in the regular army.

Historically, the British militia dated from Anglo-Saxon times, when all landholders were obliged to bear arms as a quit or body rent for the land they occupied. This was expanded by Alfred the Great into the *fyrð* (*q.v.*). With the development of feudalism, which raised its armies from the fiefs (*q.v.*), the *fyrð* ceased to be important. When the conflict between crown and barons reached a head early in the 13th century, the *fyrð*, or militia, provided the bulk of the royal troops. As the country became more settled, however, the militia again fell into decay.

Following the threat of the Spanish Armada, a special home defence force was raised on a county basis by the lords lieutenant, the expense of arming and equipping the troops being defrayed by the counties, while the officers were commissioned on a property qualification. The troops were mainly volunteers, but when the strength fell below establishment the deficiency was made up by ballot. In 1604 James I revived the *fyrð* as a force of 160,000 men called the trained bands. During the Civil War, the trained bands generally sided with parliament, and a number of them became officer-producing units for the Commonwealth army.

17th-20th centuries

After the restoration, a new militia was established, but except in London was abolished 1662. In 1688 an act authorised the raising of the militia for one year, and for some time afterwards it was sanctioned annually, as is the regular army today. This militia was called out during the Jacobite rebellions of 1715 and 1745. Its embodiment in 1745 showed it to be thoroughly inefficient, and in 1757 a new militia act made householders liable for service, men between 18 and 45 being chosen by ballot to serve for a period of three years. The force received an annual training and in its first year raised 30,000 men. Men drawn for service could buy a substitute for £10, and many householders formed militia clubs which, on insurance principles, purchased a substitute for any member drawn for the militia. Until 1802 only Protestants were liable for militia service or accepted as substitutes.

During 1759-62, 1778-83, 1792-1802, 1803-1816, and 1854-56, the militia regiments, embodied to form the home garrisons in the absence of the regular army overseas, reached a high degree of efficiency, and every inducement was offered to the men to enlist individually in the regular army, the War office at one time offering militiamen a bounty of £40 to transfer.

In 1867 one-fourth of each battalion of militia was invited to accept the same liability to foreign service as the army reserve, in consideration of an annual bounty of 20s.; these volunteers were known as militia reservists. The militia did good service during the S. African War of 1899-1902, but their voluntary offer to go abroad was on condition that the men should serve under their own officers like a regular unit. Five years later,

1907, R. B. Haldane brought the militia into his scheme for an expeditionary force, by abolishing all units as militia and reviving most of them as special reserve battalions, whose function in war was to furnish drafts for the regular battalions. In 1914-17 virtually all reinforcements for the 1st and 2nd regular battalions were furnished by the 3rd (old militia) battalions.

After the First Great War the title of militia was revived, but the 88 battalions were placed in suspended animation and were merely names in the army list. In 1953 all militia units were formally disbanded and the force ceased to exist as part of the British army. In 1939 the name was given to the conscript force called up under the compulsory military service Act of April of that year. With the introduction of general conscription at the beginning of the Second Great War, the term was again dropped. The only militia units in the British Commonwealth are those of Malta, Bermuda, and the Channel Islands, all on a voluntary basis.

Under the fascist regime, Italy had an active militia which was, in effect, the private army of the ruling political faction. A similar organization, the *Schutzstaffeln* (S.S.), was maintained in Germany to support the Nazi party.

In the U.S.A. there is a form of militia called the National Guard, established in 1933 on a federal basis to incorporate the various state guard units. Enlistment is voluntary, but in emergency the president may order the National Guard into the active service army. During the Second Great War 19 National Guard divs. served overseas with the U.S. armed forces. In peacetime the National Guard has an authorised strength of 250,000 men and may be called out to maintain order in the event of civil disturbance. See Army, British; Territorial Army.

Milk (A.S. *meolc*, milk). The fluid secreted in the mammary glands of all female mammals immediately after parturition, to provide nourishment for their young. The composition of milk, which is a mixture of fats, carbohydrates, proteins, and mineral matter dissolved or suspended in water, varies widely. The total solids content is highest in the milk of the porpoise and the whale (55 p.c. including 45 p.c. fat), lowest in that of the mare and the mule (9 p.c. including 1.2 p.c. fat).

The milk of the cow has, since the middle of the 19th century,

become of great importance in the diet of the peoples of the British Commonwealth, the U.S.A., and the countries of N.W. Europe. In total solids content, cows' milk is similar to human milk, but, as the accompanying table shows, the proportion of the various solids differs considerably. Moreover, composition varies from one individual to another, and from one breed of cow to another.

	HUMAN Per cent	Cow Per cent
Water	87.55	87.3
Fat	4.0	3.7
Sugar (lactose)	7.0	4.75
Caseinogen	0.5	3.1
Other proteins	0.75	0.4
Ash	0.2	0.75
	100.00	100.00

For the feeding of infants, cows' milk can be humanised by the addition of lactose, cream, and water, to reduce the proportion of proteins and increase the proportion of milk sugar while maintaining the same percentage of total solids. Most children, however, can take unmodified cows' milk from an early age.

The fat in milk is an imperfect emulsion. If milk is left standing the fat globules clump together and gradually rise to the surface of the milk. This is known as creaming. The milk sugar, albumen, and globulin, and part of the ash are in solution, and the caseinogen in colloidal suspension. The proteins, casein and albumen, contain all the amino acids known to be essential to life in young animals; the butter fat differs from vegetable fats in that it contains a higher percentage of volatile and unsaturated fatty acids, which are believed to be more digestible than the saturated fatty acids. In addition milk contains the fat soluble vitamins A, D, and E, and the water soluble vitamins, B₁, B₂, and C. It is a perfect food for the young. For the adolescent and the adult its inclusion in reasonable proportions forms a valuable addition to the diet.

By selective breeding the dairy cow has become a highly efficient milk producing machine. Individual cows have produced more than 3,000 galls. of milk in a lactation (approx. 12 months). The average annual quantity per cow sold off farms in Great Britain in 1939 was 550 galls. Owing to shortage of imported feeding stuffs, it fell during the Second Great War to approximately 500 gallons, but by 1948 had returned to nearly the pre-war figure.

The British herds which give good milk production are the Ayrshire, Dairy Shorthorn, Friesian, Guernsey, and Jersey; the first three give the greatest yields of milk, the Channel Is. breeds produce milk of the highest butter fat content. Red Polls of East Anglia, Welsh Blacks in Wales, South Devons in Devon enjoy popularity.

During the 20th century increasing attention has been given by local authorities, milk producers, and distributors to the hygienic production and handling of milk. Bovine tuberculosis can be transmitted through milk as also can human diseases like typhoid fever, diphtheria, etc. These pathogenic dangers can be eliminated by pasteurisation (*q.v.*) or by sterilisation. The standard method of sterilisation is first to subject the milk to a homogenisation process which breaks up the fat globules and distributes them evenly throughout the milk. The milk is then bottled and capped, heated to a minimum of 212° F. for 20 minutes, and then cooled. A more effective method of sterilisation entails heating the milk to a minimum of 220° F. Although sterilisation processes kill the bacteria in milk, the high temperatures involved tend to damage or to reduce vitamin content. Pathogenic defects in milk can be eliminated to some extent by a process called heat-treatment; this is similar to pasteurisation, but it is not always carried out in full conformity with the specific requirements of that method.

Wholesalers normally pasteurise or otherwise process the milk before delivery to retailers, either in churns or in bottles. Where the processing plant is also the centre of distribution to consumers, the milk is bottled and held in cold rooms for collection by the roundsman.

The elimination of infected cows and the gradual increase in the number of tubercle free herds received official encouragement in 1923 under the Milk Special Designations Order, when tuberculin tested milk (including certified milk) received recognition, and its sale at a special price to cover the milk producer's extra expenses was permitted. By 1948 nearly 17 p.c. of the milk produced in Great Britain was tuberculin tested. A tuberculin tested herd may, however, include cows suffering from abortion or mastitis, so that the milk it gives is free from only one of the three bovine diseases which may be transmitted by milk.

MILK PRESERVING. Milk in excess of needs produced during the summer can be preserved for subsequent use either by concentration and storage in hermetically sealed cans or by drying. Unsweetened condensed milk, normally concentrated 2½ times to include 31 p.c. of total solids, is preserved by sterilisation. The high sugar concentration of sweetened condensed milk, which contains 31 p.c. of milk solids plus 40 to 42 p.c. of added cane sugar, prevents the growth of bacteria.

Milk can be dried by:

- Roller Drying*, in which the milk, finely sprayed on to steam heated revolving rollers, is scraped off after less than one revolution of the roller as "milk paper," and subsequently ground to powder. This form of dried milk, which keeps well, is the type used as national dried milk and in most of the proprietary infant foods.
- Spray Drying*, in which milk, usually concentrated to about 40 p.c. solids by evaporation in vacuum, is sprayed into a large enclosed chamber through which heated air is rapidly moving. The droplets of milk rapidly lose their moisture to the hot air and fall as a fine powder to the bottom of the chamber, from which the powder is removed mechanically. This powder is almost 100 p.c. soluble and, when reconstituted, very closely resembles pasteurised milk, with the exception that the cream will not rise owing to the fine division of the fat globules effected when spraying into the drying chamber. This type of dried milk was used extensively during the Second Great War in feeding troops operating under difficult conditions. Separated milk, dried by the spray process, is much used in the manufacture of ice cream and in the chocolate and sugar confectionery industries.

E. Capstick, M.Sc.

Milk. River of Canada and the U.S.A. Rising in the Rocky Mts. of Montana, near the Alberta boundary, it flows E. through Alberta for about 200 m. and then for a further 300 m. through Montana to the Missouri.

Milk Bar. Bar for the sale of milk and milk drinks for consumption on the premises; including "milk shakes" with various fruit and other flavours, malted milk and proprietary milk drinks, ice-

cream, tea, coffee, and cocoa. Cakes, sandwiches, and other light refreshments are also available.

The first milk bars were opened in Australia in the early 1930s, and in 1935 an Australian, Hugh D MacIntosh, came to England and opened the first British milk bar in Fleet Street, London, Aug., 1935. The idea won immediate popularity, and, with encouragement from the Milk Marketing Board, milk bars spread throughout the country. In 1950 there were some 400 registered with the Milk Bars Association of Great Britain and Ireland, which lays down certain standards for the equipment and storage plant of milk bars, compelling them to store their milk in refrigerated containers below 42° Fahr. The sale of milk and milk drinks in the U.S.A. takes place at similar bars installed in drug stores.

Milking. The process of extracting milk from the cow or goat. It is usually done by hand, but machine milking has become widely used, as this saves labour. The udder of the cow consists of four separate sections or quarters, two fore, and two hind, each quarter having a teat of its own. Milk flow is controlled by a hormone oxytocin, and some stimulus given just prior to milking may increase the yield. Hand milking is carried out by grasping the teats part of the way round and pressing them against the palms by the finger tips. The pressure should be horizontal, commencing at the top of the teat, and worked downwards. A quick rhythmic action is best, with movement coming from the wrists and not the elbows. The fore quarters are milked first, then the hind, but it is necessary to milk the fore quarters again, and often individual quarters separately, to ensure efficient stripping. Milk left in the udder reduces yield. In addition, the strippings are richest in fat and other food nutrients.

Machine milking combines an action of pressure, release, and suction. Hand stripping after machine milking, though common, can be avoided with some cows, by applying slight downward pressure to the base of the teat cups and at the same time massaging the udder. Whatever the milking practice, cleanliness, quietness, and careful handling of the animals are essential. See Dairy Farming.

Milk Marketing Board. Organization of milk producers in England and Wales, set up Oct., 1933, on the instance of the National Farmers' Union, to administer a national marketing scheme

for milk. The board has statutory powers under the Agricultural Marketing Acts of 1931 and 1933, and no non-member is permitted to sell milk. It came into existence on the vote of over 96 p.c. of the milk producers in the country. An entirely self-governing body, it has power to vote itself out of existence at any time.

Of the 17 members of the board, twelve are the elected representatives of the regions into which the country is divided for the purposes of the marketing scheme, three are nationally elected, and two are co-opted. Regional committees advise on the board. The board operates a pooling scheme to ensure a satisfactory price to milk producers, collects all monies from over 9,000 dairymen each month, and pays out to nearly 160,000 producers, and with a fleet of over 6,000 road vehicles collects all milk from farms and delivers it to its first destination. It has introduced various schemes for grading supplies, with premiums for the higher grades. The provision of free milk in schools and of free or cheap milk to mothers and children was developed from experiments carried out by the board before the Second Great War.

The board established cattle breeding centres, and set up a number of creameries which provide information on the costs of processing and the manufacture of dairy products.

Milk Sugar. Variety of sugar found in milk. It is recovered from whey obtained in the manufacture of cheese. Milk sugar appears as sweet, rather gritty crystals, partly soluble in water, and is used in pharmacy. It is not so sweet as cane sugar, and chemically is better known under its alternative name of lactose (*q.v.*).

Milkwort (*Polygala vulgaris*) OR ROGATION FLOWER. Perennial herb of the family Polygalaceae.



Milkwort. Flowering stems of this meadow herb

A native of Europe (including Britain), N. Asia, and N. Africa, it has short, wiry stems and somewhat leathery, oblong leaves. Its flowers are white, pink, blue, or purple. It grows among grass in meadows and on heaths, and cows eating it

were formerly supposed to yield more milk than ordinarily.

Milky Way. This luminous band of stars stretching across the sky is more correctly called the Galaxy (*q.v.*).

Mill (Lat. *molere*, to grind). Originally a machine used for grinding. To mill means to reduce something, corn, for instance, to very small particles. It is also used for the process of giving a raised edge to coins. From its use for a machine the word has come to be used also for the building in which the machinery is, *e.g.* a flour-mill, and other buildings containing machinery, *e.g.* a cotton mill.

Mill, JAMES (1773-1836). British utilitarian philosopher, historian, and economist. Born near Mont-



James Mill, British philosopher

rose, Forfarshire, April 6, 1773, after studying at Edinburgh he came to London, and embarked upon a literary career. His *History of India*, published 1817-18, led to appointments in the examiners' office of the E. India Company.

In philosophy, he is one of the chief representatives of associational psychology. In his *Analysis of the Phenomena of the Human Mind* he reduces all psychological reality to one fact—sensation, and all its laws to one—the law of inseparable association, the factors of which are liveliness of impression, repetition, and interest. In politics, Mill was regarded as the founder of philosophical radicalism. He died at Kensington, June 23, 1836. See Life, A. Bain, 1882.

Mill, JOHN STUART (1806-73). British philosopher and economist. The son of James Mill, he was born in London, May

20, 1806. His education, begun by his father, was completed in France. An extraordinarily precocious child, at 14 he had acquired a knowledge

of a great variety of subjects, including classical literature, logic, in addition to political economy, history, and mathematics.

An acute mental crisis, induced by an exclusively intellectual education, was surmounted with the



J. S. Mill

help of a study of Wordsworth. He was employed in the office of the East India Co. 1820-58, and retired on a pension when the company came to an end. From 1865-68 he was M.P. for Westminster, in 1866 Lord Rector of the university of St. Andrews. He died at Avignon, May 8, 1873. The influence of Mrs. John Taylor, whom he met in 1830 and married in 1851, greatly affected his views, and tended to modify and humanise his doctrinaire Benthamism.

From an early age Mill was engaged in literary work, writing books and contributing to reviews. His *System of Logic*, 1843, is an elaborate exposition of the theory and methods of induction. The basis of induction is not belief in the uniformity of the laws of nature, but the laws of causality, resting on the fact that we see a succession of phenomena always occurring in the same order. His metaphysical standpoint is set forth in his *Examination of Sir William Hamilton's Philosophy*, 1865. He is strongly opposed to all forms of intuition, while he admits the reality of the external world and of mind, as based upon the principles of association. Matter is a permanent possibility of sensation, and mind a series of feelings with a background of possibilities of feeling. In Ethics, he is an altruistic utilitarian. Happiness is the highest of all aims, not a selfish happiness, but a happiness identical with that of mankind in general. Happiness itself differs not only in quantity, but also in quality; there are higher and lower kinds of it, the former chiefly intellectual. Moral judgements and feelings are the result of association.

For many years Mill was an enthusiastic admirer of Comte's system of positive philosophy. When a young man he had founded a utilitarian society. His *Principles of Political Economy*, 1848, the object of which was to systematise and complete the theories of Adam Smith and Ricardo, is still considered indispensable for the study of the subject. He was the first to give a full description of the phenomena which determine current value, and also to see that exchange is not a primitive and necessary phenomenon, but only relative to a certain mode of appropriation. Hence value is not a natural and necessary quality of wealth. It is a relative term; there is no such thing as a general rise or a general fall of values. The temporary or market value of a thing depends on the demand and supply. The demand varies with the value, and the value always so adjusts itself

that the demand is equal to the supply. In politics, Mill, at least in his later years, belonged to the advanced radical party. His essay *On Liberty*, 1859, represents his mature political views. He was a warm defender of the rights of the working classes and an enthusiastic advocate of women's suffrage. See *Liberalism*; *Utilitarianism*.

Bibliography. Autobiography, 1908; Lives, W. L. Courtney, 1889; M. Packer, 1954; R. Borchard, 1957; J. S. M., a Study of his Philosophy, C. Douglas, 1895; The English Utilitarians, L. Stephen, 1900.

Millais, Sir John Everett (1829-96). British painter. Born at Southampton. June 8, 1829, he



Self portrait, Uffizi Gallery, Florence

came of a Jersey family, and was taken thither at an early age. Some drawings executed when he was seven were exhibited at the Academy in the winter of 1898. In 1838, on the recommendation of Sir M. A. Shee, he was sent to Sass's drawing school in Bloomsbury, and later to the R.A. schools. When ten he received a silver medal from the Society of Arts, and he took his first prize at the schools a year later. Shortly after 1848, with Holman Hunt and Rossetti, he started the Pre-Raphaelite Brotherhood.

Millais' first important picture, painted on the lines laid down by the P.R.B., was the *Banquet Scene from Keats' Isabella and the Pot of Basil*, exhibited in 1849, followed in 1850 by *Christ in the House of His Parents*, better known as *The Carpenter's Shop*. In 1921 a successful appeal was made to the nation to acquire the latter, then in the Tate Gallery, to prevent its being sold to the Melbourne Gallery, Victoria, Australia, the price being

10,000 guineas. Many similar pictures followed, notably *The Huguenot*, *The Proscribed Royalist*, *The Order of Release*, etc., but gradually Millais was escaping from the rigid lines laid down by his companions in the P.R.B. and developing definite characteristics of his own. Perhaps his two most important pictures executed under Pre-Raphaelite influence were *Autumn Leaves*, 1856, and *The Blind Girl*, one of his greatest works. Later he stayed with Ruskin in the N. of England and in Scotland. *Sir Isumbras at the Ford*, exhibited in 1857, marked a departure in style which evoked a protest from Ruskin. Its successors, *The Vale of Rest* and *Apple Blossoms*, clearly showed the emancipation of Millais from his early mannerisms.

In the sixties Millais was largely concerned with book illustration. From the time that he became an R.A. in 1863 there was a great demand for his portraits, considerable desire to obtain his landscapes, especially those painted in Scotland, and an ever increasingly enthusiastic public for his sentimental paintings, such as *The North-West Passage*, *The Princes in the Tower*, *The Yeoman of the Guard*, and *The Princess Elizabeth*. Among his finest portraits must be mentioned those of the Marquess of Hartington, Lord Tennyson, Cardinal Newman, Sir James Paget, Gladstone, Du Maurier, and Mrs. Jopling.

Millais in 1855 married the lady who had been Mrs. Ruskin, but who had obtained a decree of nullity of her first marriage. He was created a baronet in 1885, succeeded Lord Leighton, as P.R.A., Jan., 1896, and died of cancer of the throat Aug. 13, 1896. He was buried in St. Paul's Cathedral, and a statue by Brock was erected in the grounds of the Tate Gallery.

Millais was a buoyant, popular personality, strong, manly, and genial. It is by his Pre-Raphaelite pictures and his portraits that he will best be remembered. His pictorial work in black and white can hardly be paralleled. Its charm and dignity were remarkable. He cannot be regarded as an inspired painter, and in his landscapes showed himself unacquainted with the subtleties of atmospheric effect or momentary illumination. He was, however, a man of patience and quickness of vision, and he spared no toil to arrive at his own pictorial expression. See *Pre-Raphaelites*. *Pron.* Millay.

Bibliography. Life and Letters, J. G. Millais, 1899; Lives, J. E. Reid, 1909; Arthur Fish, 1923; *The Order of Release*, Sir W. James, 1948.

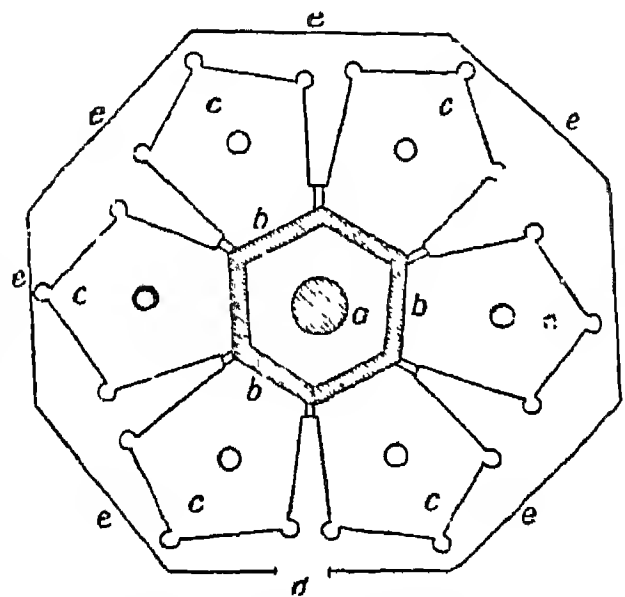
Millar, GERTRUDE (GERTIE) (1879-1952). British actress. Born at Bradford, Yorks, Feb. 21, 1879, she first appeared on the stage in a Manchester pantomime, toured the provinces in musical comedy, and made her London debut in *The Toreador*, at the Gaiety Theatre, 1901, playing there in musical comedies until 1907. Her successes included *A Waltz Dream*, 1908; *Our Miss Gibbs*, 1909; *A Quaker Girl*, 1910; *Gipsy Love*, 1912. She married (1) Lionel Monckton (*q.v.*); (2) 2nd earl of Dudley (d. 1931). She retired from the stage in 1918, and died April 25, 1952.

Millard, EVELYN (1869-1941). British actress. Born at Kensington, Sept. 18, 1869, she studied at the R.C.M. and made her first appearance on the stage in *The Dancing Girl*, 1891. Having played leads with Alexander, Tree, and Waller, she went into management at the Garrick and other theatres during 1908-10. Plays in which she made a name include *The Importance of Being Earnest*, *The Prisoner of Zenda*, *Monsieur Beaucaire*. She came out of retirement to play Calpurnia in *Julius Caesar* at the Shakespeare tercentenary performance, 1916. She died March 9, 1941.

Millau. Town of France, in the dept. of Aveyron. It lies on the right bank of the Tarn at the S.W. end of the Cévennes, 74 m. by rly. N. of Béziers. The church of Notre Dame is in a mixture of

1892, she was educated at Vassar College, and published a first volume, *Renascence and other Poems*, in 1917. A lyric poet of distinction, who could strike the tragic note effectively, she won the Pulitzer prize for poetry in 1922. She published her collected sonnets in 1941, her lyrics in 1943. She died Oct. 19, 1950.

Millbank. District of S.W. London, now in the city of Westminster. The name applies strictly



Millbank. Plan of the old London penitentiary. *a.* chapel and governor's house *b. c.* Bastions *d.* Entrance. *e.* External walls

to the thoroughfare on the left bank of the Thames between Great College Street and Vauxhall Bridge Road. On the river bank, originally built to act as one side of the mill-race serving the mill of the abbot of Westminster, are the Victoria Tower Gardens. The chief buildings are the headquarters of the ecclesiastical commission and the crown agents for the colonies; Imperial Chemical House and Thames House; Millbank barracks; Tate Gallery; Millbank Hospital (h.q. of the R.A.M.C.).

What was first known as Millbank Penitentiary was the outcome of an Act of 1778, providing

for penitentiary houses in accordance with certain ideas set afoot by Howard and other prison reformers. It was modelled by Smirke on the lines described in Bentham's *Panopticon*, or the *Inspection House*, 1778. Built in 1812-22, at a cost of more than £500,000, on ground bought in 1799 from the marquess of Salisbury, it resembled a wheel, the axle of which comprised the chapel and governor's house.

From this radiated six bastions, each with five sides and terminating externally in towers.

The external walls, forming an irregular octagon enclosed upwards of 16 acres, and were once surrounded by a moat. The buildings were of three storeys, were connected by covered ways with the chapel, and the dark passages, staircases and tortuous windings of the interior proved bewildering even to old warders. Every convict sentenced to transportation was first sent here and was solitarily confined. The system represented by the penitentiary was condemned in 1843, and the place, made a military prison in 1870, was closed Nov. 6, 1890, and pulled down in 1893. Consult *Memorials of Millbank*, A. G. F. Griffiths, 1875.

Millboard. Material made from waste paper, rags, rope, and similar scrap. These are pulped and hydraulically pressed into sheets varying from $\frac{1}{8}$ to $\frac{1}{2}$ inch thick and up to 12 ft. by 6 ft. in size. Millboard is used for railway carriage panelling and partitions, and for book binding, etc.

Millennium (Lat. *mille*, a thousand; *annus*, a year). Period of 1,000 years. The term is used specifically of the ancient idea of a kingdom of Christ upon earth. Whereas many of the later Jews, basing the idea on a literal interpretation of O.T. prophecies, looked forward to the earthly millennium as the final goal, the Christian idea, based upon Rev. 20, was of a prelude to the blessedness of heaven.

Much discussion has taken place as to the meaning of the words of S. John, who foresaw Satan being bound and the martyrs dwelling with Christ for 1,000 years, at the end of which period Satan, loosed again, was to make his last assault upon the saints before being cast into the lake of fire. The doctrine of the millennium, also known as *chiliasm* (Gr. *chilioi*, a thousand), was condemned because of the excesses to which it gave rise; but it still exists in various forms and it formed part of the creed of several Evangelical divines. See *Adventists*; *Anabaptists*; *Antichrist*; *Fifth Monarchy Men*.

Millepora. Name given to a family of hydrocoralines which occur in the warmer seas. They form large chalky masses, covered with tiny pores through which the polyps protrude. These small pores are arranged in a circle around a larger central one, from which protrudes a polyp provided



Millau, France. General view of the town looking toward Causse Noir, a height of the Cévennes

Romanesque and Renaissance, and there is a notable square with arcades dating from the 12th-15th centuries. During the 16th and 17th centuries Millau was a Calvinist centre; its fortifications were destroyed by Richelieu in 1620. The chief industry is the manufacture of kid gloves. Pop. (1954) 19,209.

Millay, EDNA ST. VINCENT (1892-1950). American poet. Born at Rockland, Maine, Feb. 22,

with a mouth and specialised to act as the feeding member of the group. The smaller pores are occupied by polyps of longer body, whose function is to catch the prey and pass it to the mouth of the feeding polyp. Below the surface of the "coral" are numerous canals, which connect the different polyps into one compound organism. See Coral.

Miller, ALICE DUER (1874-1942). A New Yorker, educated at Barnard College, she married Henry Miller in 1899, and was a prominent figure socially. Her publications included *The Modern Obstacle*, 1903; *The Charm School*, 1919 (dramatised with Robert Milton, and produced at the Comedy Theatre, London); *The Beauty and the Bolshevik*, 1920; *Forsaking All Others*, 1930; *The Rising Star*, 1935. A set of nostalgic short poems, *The White Cliffs*, aroused sentiment in Great Britain and U.S.A., at the time of the threatened German invasion in 1940. A film version appeared in 1944. The author died Aug. 23, 1942, and a *Life* by her husband appeared in 1945.

Miller, HUGH (1802-56). Scottish geologist and writer. Born at Cromarty, Oct. 10, 1802, he was apprenticed as a mason and quarry man. In 1834 he became accountant in a bank at Cromarty, and next year published *Scenes and Legends of the North of Scotland*.



Hugh Miller,
Scottish geologist

In 1839 a letter published in Edinburgh on the Auchterarder case (see Free Church of Scotland) brought him into prominence with the Evangelical party in Scotland, who appointed him editor of the journal they established to advocate their policy. It was known as *The Witness*, the first issue appearing on Jan. 15, 1840, and it appeared bi-weekly. Miller was the editor, and later also its owner until his death. Temporarily insane through overwork, he shot himself, Dec. 23, 1856.

In addition to being one of the recognized leaders of the Free Church of Scotland, founded 1843, Miller was widely known as an advocate of education, franchise, and other reforms. But his reputation rests on his popular works on geology: *The Old Red Sandstone*, 1841, and *Footprints of the Creator*, 1847.

Miller, JOAQUIN. Pen name of Cincinnati Heine Miller (c. 1837-1913), an American ballad writer



Joaquin Miller
American poet

who for a time enjoyed a vogue as a primitive poet. He was born in Indiana and served as a volunteer in Walker's Nicaragua expedition. In 1863 he became a barrister, and in 1870 a county court judge in Oregon. Later he worked as a journalist. He died Feb. 17, 1913. His *Songs of the Sierras*, 1871, achieved a success that his later doggerel did not sustain. Consult *Lives*, M. S. Peterson, 1937; M. M. Marberry, 1954.

Miller, JOE (1684-1738). An English comedian. An entirely illiterate man, who is said to have married because he wanted someone at hand to read his parts to him, he made his first appearance at Drury Lane, Nov. 28, 1709, as Teague in Sir



Joe Miller,
English comedian

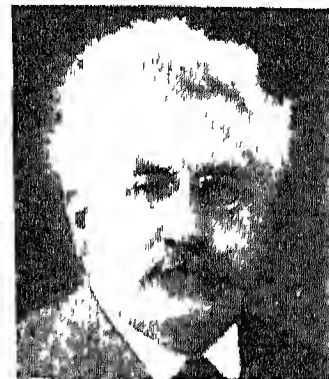
Robert Howard's comedy *The Committee*, and subsequently won success as a low comedian in many comedies by Steele, Congreve, Farquhar, and Vanbrugh. He died Aug. 16, 1738. The year after his death, John Mottley, the dramatist, brought out a collection of jocular anecdotes, *Joe Miller's Jests*; or *The Wit's Vade Mecum*, which he unwarrantably fathered upon him.

Miller, PHILIP (1691-1771). A British botanist. He was born near Greenwich, and in 1722 was appointed curator of the physic garden at Chelsea, holding his post until 1739. He died at Chelsea, Dec. 18, 1771. Miller's great work, *The Gardener's Dictionary*, first appeared in 1724.

Miller, WILLIAM (1796-1882). Scottish engraver. He was born at Edinburgh, May 28, 1796. He is best remembered for his engravings after Turner, which Ruskin valued highly. He also engraved Turner's work in the *England and Wales* series, and illustrated in engraving Rogers's poems and Scott's works. He died at Millerfield, Jan. 20, 1882.

Millerand, ALEXANDRE (1859-1943). A French president. A barrister, born in Paris on Feb. 10,

1859, he was elected deputy for Paris in 1885 as a Radical-Socialist, and in 1887 was made a member of the budget committee. He gave special attention to social questions, fiscal reform, and the championing of workmen's syndicates. He became leader of the Socialists, but his acceptance of office as minister of Commerce in Waldeck-Rousseau's government of 1899 led to his expulsion from the party in 1904. In 1909 Briand made him minister of public works, and in 1912 he became, for a year, Poincaré's minister of War. He was recalled on the outbreak of the First Great War, but in 1915 he again resigned, and remained out of office until appointed commissioner-general for Alsace-Lorraine in 1918. He succeeded Clemenceau as premier, Jan., 1920, becoming also foreign secretary. When President Deschanel resigned the following September, Millerand was elected in his place; but in May, 1924, Herriot, whose *Cartel des Gauches* had secured a majority at the elections in May, refused to form a government under his presidency. Millerand formed an alternative cabinet, but the chamber refused to recognize it; he thereupon resigned the presidency and virtually forsook public life. He died April 6, 1943.



Alex. Millerand,
French statesman
Henri Manuel

Miller Effect. Term in electronics. It refers to the energy fed back from the anode to the grid circuit of a thermionic valve, through the internal capacitance between these electrodes.

Miller Indices. Term referring to the method of defining a set of parallel planes in a crystal which are being used in reflecting incident X-rays.

Millerite OR NICKEL PYRITES, OR CAPILLARY PYRITES. Mineral consisting of nickel sulphide (NiS) with traces of cobalt, copper, and iron. It crystallises in the hexagonal system, but usually occurs as fine hair-like crystals with a brassy-yellow metallic appearance. It forms nodules in clay-ironstone and in veins with other nickel and cobalt minerals as in Cornwall, Saxony, and Ontario.

Miller's Thumb. Popular name for the small freshwater fish, *Cottus gobio*. It is better known under the name bullhead (*q.v.*).

Millet. A general term for a number of botanically diverse grasses grown for both grain and forage and constituting important sources of human food in China, India, S. Russia, the Balkans, and Africa. Foxtail millet or Italian millet (*Setaria italica*), broom corn or proso millet (*Panicum miliaceum*), barnyard or Japanese millet (*Echinochloa frumentacea*), pearl millet (*Pennisetum glaucum*) and finger millet (*Eleusine coracana*) are all grown extensively. Like the sorghums, the millets are Old World plants, but were introduced into the U.S.A., where their popularity as forage plants has, however, declined since the introduction of Sudan grass. Considerable heat is necessary for the growth of millets, which are very susceptible to damage by frost. See Sorghum.

Millet, JEAN FRANÇOIS (1814-75). A French painter. Born at Gruchy, near Cherbourg, Oct. 4, 1814, the son of peasants, he received early instruction from Mouchel and Langlois. He went to Paris with a scholarship, 1836, and entered Delaroche's studio, where Diaz and Rousseau were also students. He began by painting nudes and imitations of Watteau, e.g. *L'Amour Vainqueur*. For a time he painted signs at Cherbourg, returning to Paris in 1842. *Milk Woman* was accepted by the Salon in 1844, but *Oedipus Unbound* provoked hostility. By 1849 Millet had sufficient independence to settle at Barbizon and paint pictures of peasant life, for the naturalistic, dignified, and sympathetic treatment of which he has few equals. Some of his pictures have become, through reproduction,



world-famous. The Sowers was exhibited in 1851; *The Gleaners*, 1857; *The Angelus*, and *Death and the Woodcutter*, 1859; *The Man with the Hoe*, 1863. He was commissioned in 1873 to decorate the Pantheon with the Four Seasons, but only charcoal studies were produced. He died Jan. 20, 1875. See *Angelus*; consult *Lives*, A. Sensier, Eng. trans. H. de Kay, 1881; J. C. Ady, 1910; P. Gsell, 1928. *Pron.* Meelay.

Mill Hill. Dist. of the Middlesex bor. of Hendon. Mainly residential, it lies about 8 m. N.W. of London, and is served by rly., an arterial road, and London Transport. The old village, at an elevation of 400 ft., commands delightful views. Here are Mill Hill school (*v.i.*); the London univ. observatory (see illus. p. 6168); the National Institute for Medical Research, opened 1950; the parish church of S. Paul 1829-36: S.

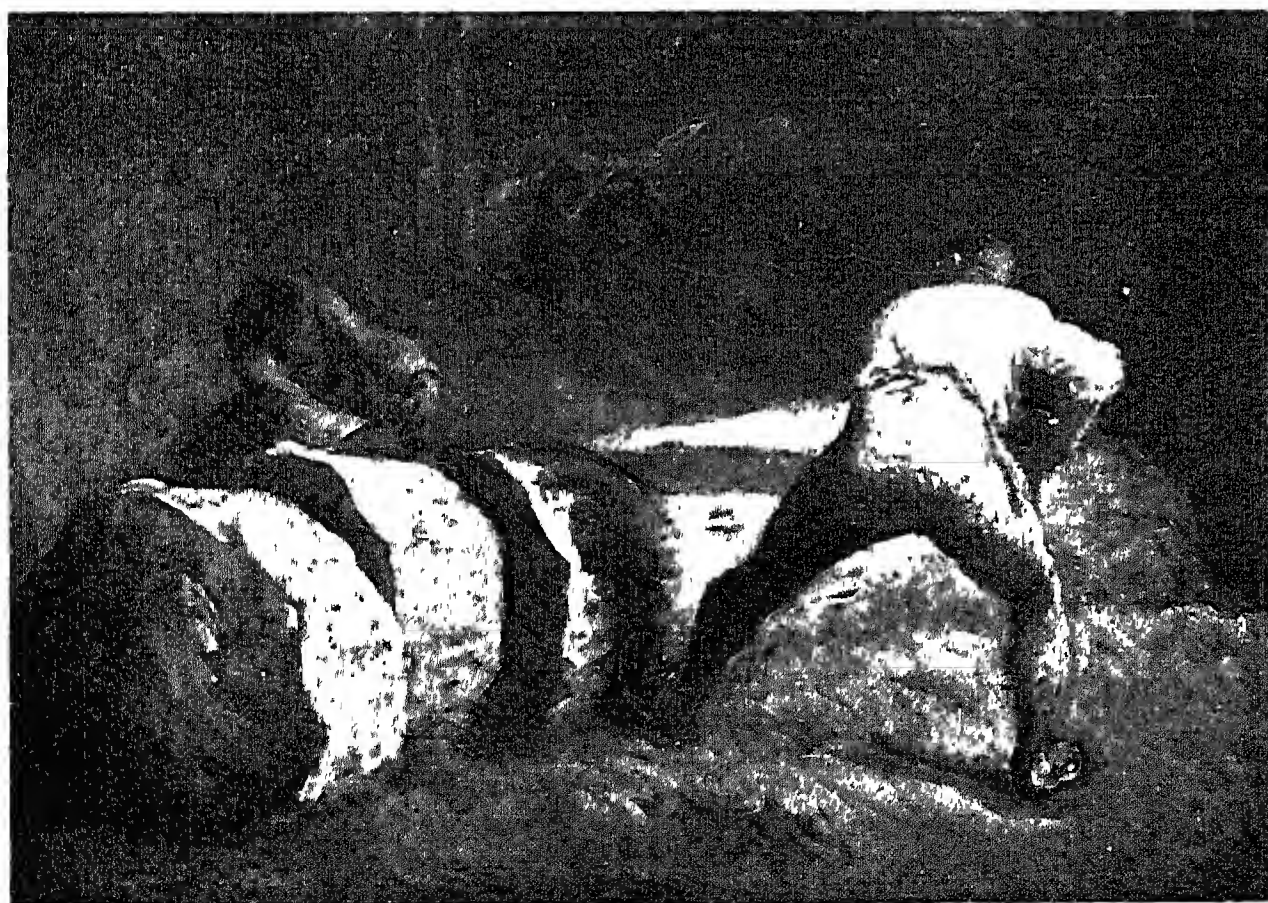
Joseph's missionary college; the Linen and Woollen Drapers' cottage homes; the national institute for medical research; and the h.q. of the Middlesex Regiment. S. Vincent's convent was once known as Littleberries House, said to have been built by Charles II, and to have had Nell Gwynn as occupant. On the site of Mill Hill school were the gardens of Peter Collinson (1694-1768), naturalist and antiquary. Wm. Wilberforce lived at Highwood. Pop. 17,146.

Mill Hill School. English public school. Founded in 1807 as a school for the sons of non-conformists, its constitution was remodelled in 1869. It has a fine range of buildings, standing in grounds of 70 acres, at Mill Hill, Middlesex, accommodation being provided for about 400 boys. The school is divided into upper, middle, and lower, and there are classical and modern sides. Although mainly supported by nonconformists, it has no sectarian tests. There are scholarships to the universities and to the school itself. A gate of honour commemorates 200 old boys killed in the First Great War.

Millibar. Thousandth part of a bar, the meteorological unit of atmospheric pressure on the C.G.S. system. The older practice of speaking of atmospheric pressure as equal to so many inches, or millimetres, is open to objection, for these are units of length, not of pressure. A bar (a million dynes to the sq. cm.) is equal to the pressure of a column of mercury 750.1 millimetres, or 29.53 inches, high at 0° C. in lat. 45°. The millibar has been used by the British meteorological office since May, 1914. See *Meteorology*.

Millième. An Egyptian copper coin. It is the tenth part of a piastre, or the one-thousandth of an Egyptian pound. The $\frac{1}{2}$ piastre is called 5 millièmes. See *Piastre*.

Millikan, ROBERT ANDREWS (1868-1953). American physicist. Born at Morrison, Ill., March 22, 1868, he was educated at Columbia and German universities and became assistant in physics at Chicago in 1896. By 1910 he was professor, and in 1921 chairman of the executive of the California Institute of Technology and director of its Norman Bridge laboratory. There, as at Chicago, his studies and writings placed him in the front rank of living physicists, his work on electrons being recognized by the Nobel prize, 1923. Millikan established the common identity of electrons, measured the charge of an electron by means



Jean François Millet. *The Wood Sawyers*, a notable example of his work
By courtesy of the Victoria and Albert Museum

of the oil-drop experiment (*q.v.*), and did valuable work on photo-electric effects. Among his books are *Science and Life*, 1923; *Evolution in Science and Religion*, 1927; *Time, Matter, and Values*, 1932; *Cosmic Rays*, 1939; and an autobiography, 1951. He died in California, Dec. 19, 1953.

Millin, SARAH GERTRUDE. Contemporary South African writer, native of Cape Province. She published her first novel, *The Dark River*, in 1920, and a series of dramatic studies mostly against an African background: *Mary Glenn*, 1925; *An Artist in the Family*, 1927; *The Coming of the Lord*, 1928; *Three Men Die*, 1934; *What Hath a Man?*, 1938. She published a war diary in 3 vols., 1944-46, and a series of plays based on the life of Gen. Smuts. *The Night is Long*, 1941, was autobiographical.

Milling. Method of machining to obtain a desired size or shape on the surface of a work-piece by removing layers of material with a rotating multi-toothed cutter. Usually the work-piece is mounted on the machine table and moved past the cutter. The latter is known as a mill and in its simplest form is made from a cylinder of cutting steel by machining and grinding a series of cutting edges or teeth longitudinally on its circumference. These teeth may be straight or helical, and may extend radially down the end faces of the cylinder so that they will cut at the sides as well as the circumference. Usually the cut is wide and deep, although the actual cuttings are relatively thin. There are two methods of milling: (*a*) up-cut, in which the mill teeth tend to push the work-piece away as they rotate, and (*b*) down-cut, in which the teeth tend to draw the work-piece closer in as they rotate.

Milling is the name given to serrations stamped on the edges of more valuable coins, preventing the fraud which can be perpetrated by skimming metal from the edges of unmilled coins whilst leaving them apparently untouched. For milling, *i.e.* grinding grain, see *Flour Mill*.

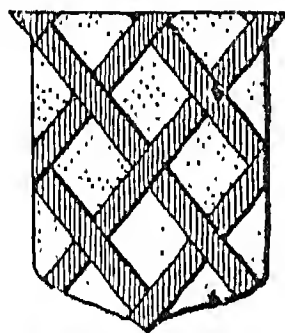
Millipede. Group of arthropods, which, with the centipedes, form the zoological class Myriapoda (many-footed). They have long, rounded and segmented bodies, with a hard chitinous covering, and usually two pairs of legs on each segment. Their legs are certainly numerous, but do not justify the name "thousand-footed." They differ from the centipedes in being vegetarian, and they lack the poison



Millport, Buteshire. View of the town and southern shore of Great Cumbrae Island

claws. Great Britain has several species, which may be found lurking under stones in the daytime and rolling themselves into a coil when disturbed. They can do harm to crops especially if they become numerous, when they are best checked by dressings of lime and soot. See *Myriapoda*.

Millom. Town and rural dist. of Cumberland, England. Millom stands on the W. side of the estuary of the Duddon, 9 m. from Barrow-in-Furness, with a rly. station. The chief building is the church of Holy Trinity, partly Norman, with some very

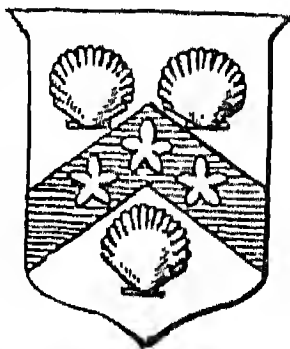


Millom arms

interesting features. Millom grew up around a castle built here about 1100; this was long the residence of the Huddleston family, and in the Middle Ages its lords had the power of sentencing their dependents to death. It was besieged during the Civil War, and is now a ruin. Millom owes its modern growth to the development of the Furness coal and iron field. Iron ore is mined here, and there are large furnaces and ironworks. Pop. (1951) rural dist., 13,428.

Mill on the Floss, THE. Novel by George Eliot (*q.v.*), published in 1860. Her third work of fiction and second long novel, it is a companion work to the earlier *Adam Bede*, as a close and detailed picture of English provincial life. Its prime interest is as a study of a brother and sister, preserving some of the most charming recollections of childhood to be found in English literature, and, further, it contains a series of masterly portraits of the other members of the Tulliver family.

Millport. Police burgh and watering-place of Buteshire, Scotland. It stands on the S. side of the island of Great Cumbrae, in the



Millport arms

Firth of Clyde, 24 m. S.S.W. of Greenock. The chief buildings are the "Garrison" and the episcopal cathedral. Here is a marine biological station, and for visitors there are golf links, boating, bathing, etc. Millport has a regular steamboat service with the ports on the Clyde. The opening of the sea on which it stands is called Millport Bay. Pop. (1951) 2,012.

Mills, BERTRAM WAGSTAFF (1873-1938). British showman. The son of a coach-builder, Mills was born in London, Aug. 11, 1873, and acquired a familiarity with horses when he entered his father's business at the age of 15. During the First Great War he served as a captain in the R.A.S.C., and in 1921 founded the circus which bore his name. For the first eight years he limited himself to an annual production at Olympia, which ran for five weeks during the Christmas season; but in 1929 he started the Bertram Mills tented show, which toured Great Britain from April to Oct. each year. The equipment



Bertram Mills, British showman

and animals filled four special trains and 75 lorries. The Olympia show employed 4,000 people, and the cost of production was from £15,000 to £20,000 weekly.

Bertram Mills was a member of the L.C.C. from 1928 to 1938. He was at one time a well-known breeder and judge of hackney harness horses, and used always to enter his "Old Times" stage-coach for the coaching marathon from Hyde Park to the Richmond horse show. He died April 16, 1938, and the Bertram Mills circus passed to his two sons.

Mills, JOHN (b. 1908). British actor, born Feb. 22, 1908, in Suffolk. He started in the chorus at the London Hippodrome, 1929, and long appeared in revues and musical comedies, though his Cockney soldier in *Red Night*,

1936, showed his acting abilities. In *Men in Shadow*, 1942, and *Duet for Two Hands*, 1945, he had stronger parts in plays written by his wife, Mary Hayley Bell. In films from 1932, Mills achieved celebrity in *Tudor Rose*, *In Which We Serve*, *The Way to the Stars*, etc.; and from 1945 he was playing leads in *Waterloo Road*, *Great Expectations*, *Scott of the Antarctic*, *Mr. Polly*, *Rocking Horse Winner*, *Morning Departure*, etc.



John Mills,
British actor

Mills Grenade. Standard hand grenade of the British army. See Grenade.

Mill Springs, BATTLE OF. Federal victory in the American Civil War, Jan. 18, 1862. The Confederate lines defending the South from invasion by the Federals were, at Mill Springs, a village some 10 m. W. of Somerset, Kentucky, held by General J. B. Crittenden. With the opening of the 1862 campaign Gen. George H. Thomas advanced towards this place with a force of 4,000 men. Crittenden hastened to meet him, and launched an attack which developed into a fierce fight. The Confederate forces, despite their valour, were driven back and routed with heavy loss. It is sometimes called the battle of Fishing Creek. A national cemetery was afterwards set up here, over 700 bodies being interred therein. See American Civil War.

Millstone. Wheel or circular mass of rock used for grinding grain. The best rocks for the purpose are the burr stones of France, being hard and porous. They are found in the Tertiary of the Paris basin, and large millstones are usually built up. The German

millstones are a basaltic lava found near Cologne. Sandstones and grits are used for millstones, the characteristics of which should be open or cellular structure, toughness and hardness, as the coarse granular sandstone found in New York and other parts of the U.S.A. Millstones are being gradually superseded by steel rollers in the manufacture of flour. See Milling.

Millstone Grit. Name given to a group of coarse sandstones and fine siliceous conglomerates occurring above the carboniferous limestone and below the coal measures of N. England. Sandstones of similar age but separated from the N. England deposits are also known by the same name. English Millstone Grit was laid down as a great delta extending from the Solway Firth S. to Liverpool and thence curving E. across England through Lincolnshire to the North Sea. The river responsible flowed S. and had tributaries draining from the Scottish Highlands and Scandinavia. The rock is used for building purposes and to make grindstones.

Millwall. District of London. It is in the Isle of Dogs, forms the S.W. part of the met. bor. of Poplar, and has Limehouse Reach on the W., Cubitt Town E., the West India Docks N., and Millwall Docks S. The last named have an area of 234 acres, 35½ acres of which are covered with water. The entrance lock in Limehouse Reach is 450 ft. long, 80 ft. wide, and 28 ft. deep at high-water spring tides. Opened 1864, Millwall Docks were linked with West India Docks in 1929 as part of the Port of London Authority scheme, and thereby linked with Blackwall Reach. There are large silos, granaries, and warehouses for storing sugar. Trade is done principally with the Baltic and N. Europe and the Americas. Much damage was done by German bombs in 1940. The name Millwall is derived from seven windmills, which stood on the wall built here to keep the Thames from overflowing at high tide.

Milman, HENRY HART (1791-1868). British historian. He was born in London, Nov. 10, 1791, and educated at Eton and at Brasenose, Oxford. He won the Newdigate prize, became fellow of Brasenose, and was ordained in 1816. During 1821-30 he was professor of poetry at Oxford. In 1835 he

was appointed canon of Westminster and rector of S. Margaret's, and in 1849 he became dean of S. Paul's, a position which he held until his death near Ascot, Sept. 24, 1868.



H. H. Milman,
British historian

His *History of the Jews*, 1829, gave offence by his treatment of Jewish history from the secular point of view. He wrote *History of Christianity under the Empire*, 1840, but his great work was *History of Latin Christianity*, 1854-56. He edited what was long accepted as the standard edition of Gibbon's *Decline and Fall of the Roman Empire*, and also wrote a *Life of Gibbon*, 1839.

Milne, GEORGE FRANCIS MILNE, 1ST BARON (1866-1948). British soldier. He was born Nov. 5, 1866, entered the Royal Artillery in 1885, and after serving in the Sudan in 1898, fought in the S. African War. During the First Great War he commanded the British contingent in Salonica in 1916, was responsible for defensive operations against the Bulgarians, and in 1918 for the offensive which ended in their capitulation. After commanding the army of the Black Sea, he retired in 1920. He became lieut.-gen. in 1917, was knighted in 1918, and was promoted field marshal in 1928. From 1926 he was chief of the imperial general staff, until in 1933 he was raised to the peerage and made governor of the Tower of London, resigning in 1938. From 1929 to 1946 he held the highly honoured position of master gunner, S. James's Park. He died March 23, 1948.

Milne, ALAN ALEXANDER (1882-1956). British author and playwright. Born Jan. 18, 1882, he was educated at Westminster and Trinity College, Cambridge, and began his career as journalist in London in 1903. Assistant editor of *Punch*, 1906-14, he collected his contributions into such light-hearted volumes as *The Day's End*, 1910; *Once a Week*, 1914; and *If I May*, 1920. The appearance in 1924 of *When We Were Very Young*, a book of children's verses, of which the central figure, Christopher Robin, was his son, set Milne among the most popular writers of his day. This was followed by *Winnie-the-Pooh*, 1926; *Now We Are Six*, 1927; *The House at Pooh Corner*, 1928. Later



Millstone as used in the Middle East for grinding corn by hand. This form is of great antiquity

publications included *Four Days' Wonder*, 1933, and his autobiography, *It's Too Late Now*, 1939.



A. A. Milne,
British writer

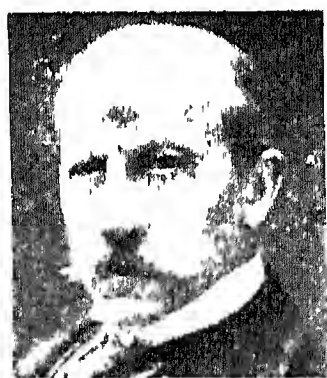
Milne's rather sentimental comedies did well in the theatre, particularly *Mr. Pim Passes By*, 1919; *The Romantic Age*, 1920; *The Dover Road*, 1922; *The Fourth Wall* (a crime play), 1928; *Michael and Mary*, 1929; *Other People's Lives*, 1932. *Toad of Toad Hall* was an adaptation of K. Grahame's *The Wind in the Willows*. Milne died at his home at Hartfield, Sussex, Jan. 31, 1956.

Milne, Sir (Archibald) Berkeley (1855–1938). British sailor. Born June 2, 1855, son of Admiral of the Fleet Sir Alexander Milne, Bt., he was educated at Wellington and entered the Royal Navy in 1869. After service in the Transkei, Zulu, and Egyptian wars, he was appointed to the royal yacht *Osborne*. Second-in-command, Atlantic Fleet, 1905–06; commander of the 2nd division, Home Fleet, 1908–10, he commanded in the Mediterranean from 1912 to the outbreak of the First Great War. He was criticised for allowing the escape of the German cruisers *Breslau* and *Goeben* into Turkish waters, but the Admiralty exonerated him, and he was given the Nore command. In 1921 Milne published *The Flight of the Goeben and Breslau*. He was promoted admiral in 1911, retired 1919, and died July 5, 1938, leaving no heir to the baronetcy.

Milne, Edward Arthur (1896–1950). British scientist. Born at Hull, Feb. 14, 1896, he was educated there and at Trinity College, Cambridge, going to the munitions inventions dept. at Portsmouth, 1916. Elected a fellow of Trinity, 1919, he held several academic posts before receiving the new Rouse Ball chair of mathematics at Oxford, 1929. He studied mathematical aspects of the sun and stars, and contributed much to the knowledge of their nature and atmospheres. Elected F.R.S. in 1926, he was awarded in 1935 the gold medal of the Royal Astronomical Society (of which he was president, 1943–45); in 1941 the royal medal of the Royal Society. He pub. *Thermodynamics of the Stars*, 1930; *the White Dwarf Stars*, 1932; and other works. He died Sept. 22, 1950, in Dublin.

Milne, John (1850–1913). British seismologist. Born at Liverpool and educated at the Royal School of Mines, he worked for some years as a mining engineer. Appointed 1875 professor of geology and mining in the Imperial Engineering College at Tokyo, a post he held for twenty years, he established the seismic survey of Japan. Milne was one of the pioneers of the systematic study of earthquakes, and as secretary of the seismological committee of the British Association was chiefly responsible for setting up seismological stations all over the world. He invented various forms of seismographs, and wrote two standard works, *Earthquakes and other Earth Movements*, 1883; *Seismology*, 1898. He died July 31, 1913.

Milner, Alfred Milner, 1st Viscount (1854–1925). British administrator and statesman. Born



Milner

Russell

of English parents at Bonn, March 23, 1854, he was educated in Germany, at King's College, London, and Balliol College, Oxford, where he had an exceptionally brilliant career, ending with a fellowship at New College. He became a barrister and journalist.

His public career really began with the post of private secretary to G. J. Goschen. This led to his appointment as under-secretary for finance in Egypt, 1889–92, and chairman of the board of inland revenue, 1892–97. He was created K.C.B. in 1895, and in 1897 was sent as governor of the Cape, conducting negotiations with Kruger before the South African War. He remained at his post during the struggle, took part in the peace negotiations, and afterwards was governor of the Transvaal and Orange River colonies until 1905.

Conscious possibly of the hostility his imperialism had aroused among Liberals, Milner, who had been made a baron in 1901 and a viscount in 1902, remained in retirement for some years, although he emerged to denounce the budget of 1909. In 1916 his former opponent, Lloyd George, chose him as one of the small war cabinet, and the two worked together closely in planning the final victory of the Allies. After the armistice Milner was appointed secretary for War.

He was colonial secretary, 1919–21, when he headed a mission to Egypt. He died May 13, 1925. Although possessed of high administrative gifts, a certain reserve prevented Milner from becoming a popular figure. He was accused of being a bureaucrat, and opposed to progress of all kinds. His writings include *England in Egypt*, 1892; *Credo*, 1925. The *Milner Papers*, 1897–1905, were edited by C. Headlam, 1931–1933.

Milngavie.

Police burgh of Dunbartonshire, Scotland. It lies to the S. of the Campsie Fells, 7 m. N.W. of Glasgow, on the



Milngavie arms

banks of Allander Water, a tributary of the Kelvin. The town is mainly residential. Industries include light engineering and the making of paper, scientific instruments, spectacle frames, bedding, mineral waters, and paint. Pop. (1951) 7,885. *Pron.* mill-guy.

Milo or Melos. Island of Greece, the most south-westerly of the Cyclades (*q.v.*). It is 14 m. in length by 8 m. wide, having an area of 60 sq. m. Of volcanic origin, it rises in Mt. St. Elias to 2,540 ft. A long inlet opening on the N.W. affords one of the best natural harbours in the Levant. The soil is fertile, yielding cereals; sulphur, gypsum, etc., are found. Plaka, the capital, stands on the N.E. shore of the inlet. Port Milo is situated near the site of ancient Melos. Here were found the statue of Poseidon, now in the Athens Museum, the Asclepius, in the British Museum, the Venus de Milo, in the Louvre, Paris, and other works of ancient art. In the prehistoric settlements at Phylakopi, much early pottery and some paintings were excavated. Milo was colonised successively by the Phoenicians and Dorians, and fell to the Athenians in 416 B.C. The Turks took possession of the island in 1537. Pop. 5,000. *Pron.* Meelo.

Milo. Famous athlete of ancient times, belonging to Crotona, S. Italy. He gained many victories at the Olympic and other games, and is said on one occasion to have carried a heifer on his shoulders through the stadium at Olympia, and eaten it in one day. In 511 B.C. he was general of the army which defeated the Sybarites. It is said that in his old age, while endeavouring to rend a split

trunk, his hand was trapped, and, being unable to get away, he fell a victim to wolves. *Pron.* Mylo.

Milo, TITUS ANNIUS (d. 48 B.C.). Roman politician. A member of the aristocratic party, he was largely responsible, as tribune of the plebs, for securing the return of Cicero from exile, 57 B.C. This brought him into conflict with Clodius. Both were in the habit of going about Rome attended by bands of armed gladiators, and the two bands meeting on one occasion on the Appian Way, Clodius was killed, 52 B.C. Arraigned for the murder, Milo was defended by Cicero, but a tumult arose, Cicero was intimidated and did not deliver his speech, and Milo was condemned and went into exile. Milo afterwards led a band of insurgents in S. Italy and was slain near Thurii.

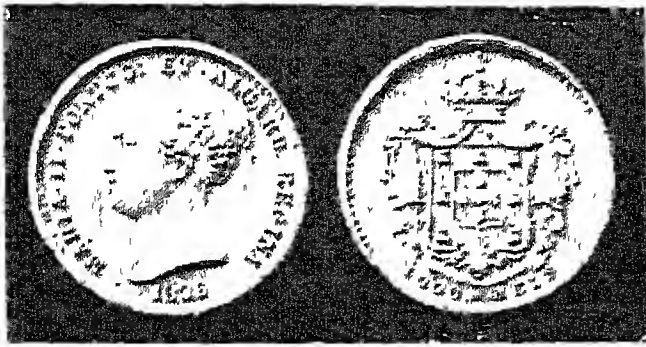
Milosh Obrenovitch (1780-1860). Prince of Serbia. Of peasant birth, he was employed in the cattle trade by his half-brother, Milan Obrenovitch, who was already known as a patriot. Milosh, whose real name was Theodorovitch, took his brother's sur-



Milosh Obrenovitch,
Serbian prince

name, became voivode in 1807, and distinguished himself in the rising against the Turks headed by Karageorge (*q.v.*). In 1813 the Turkish campaign to re-establish order drove the latter to take refuge in Austria, but Milosh remained in Serbia, made his peace, and was appointed voivode of Rudnik. In 1815 he raised his standard against the Turks, drove or bought them out of the country, and two years later was elected prince of Serbia, under the suzerainty of Turkey. The next twenty years were spent in developing and establishing order in the country. But in 1839 Russia, who had viewed with disapproval Milosh's independent spirit and friendliness with Great Britain, fomented an agitation which forced him to abdicate, and he lived in retirement until 1858, when, on the expulsion of Alexander Karageorge, he was again given the throne. He died Sept. 24, 1860. See Belgrade.

Milreis OR MILREAS (Port. *milreis*, a thousand reis). Obsolete Portuguese gold coin nominally worth 4s. 5d. It has been superseded by the escudo (*q.v.*). The



Milreis. Obverse and reverse of obsolete Portuguese gold coin; $\frac{1}{2}$ actual size

Brazilian milreis was a gold coin, replaced in 1942 by the cruzeiro (in 1946, 18.96 cruzeiros to the \$).

Miltiades. Athenian soldier (d. c. 488 B.C.). He succeeded his brother Stesagoras as tyrant of the Thracian Chersonese. When Darius I of Persia made his expedition into Scythia, and his return was overdue, Miltiades and other Greeks, who had been left behind to guard the bridge over the Danube, recommended that the bridge should be destroyed, but their counsel was overruled. The truth of this story, related in Herodotus, has been called in question. Miltiades subsequently incurred the hostility of Darius by his conquest of Lemnos and Imbros, which were subject to Persia, and when Darius determined upon war with Greece, Miltiades sought refuge in Athens.

He was chosen one of the ten generals, and when, before the battle of Marathon, opinions were divided as to the advisability of immediate attack, the bold policy of Miltiades carried the day. Under his charge the Greeks gained their memorable victory, 490 B.C. (See Marathon.) Entrusted subsequently with a force of 70 ships to carry on the war against the Persians, Miltiades attacked the island of Paros but failed, and was wounded. Indicted for deceiving the people, he was condemned to pay a fine of 50 talents (about £12,000), and, being unable to pay, was thrown into prison, where he died. He was the father of Cimon (*q.v.*). *Pron.* Mil-ty-adeez.

Milton. Town of Massachusetts, U.S.A., in Norfolk co. On the Neponset river, 7 m. S. of Boston, it is served by the New York, New Haven and Hartford rly. A residential suburb of Boston, it includes the villages of Lower Mills, Mattapan, and East Milton, in the Blue Hills, on whose summit 635 ft., is an observatory. Voss House, built in 1773 is preserved.



Miltiades,
Athenian soldier

Musical instruments, artificial limbs, drugs, and chocolate are made. Settled in 1636, it was incorporated as a separate township in 1662. Pop. (1950) 22,395.

Milton, JOHN (1608-74). English poet and writer. He was born in Bread Street, London, Dec. 9, 1608. His father, a scrivener, was Puritan in sympathy, but a lover of literature and music, and the child enjoyed all the advantages of a cultivated home. Educated at St. Paul's and Christ's College, Cambridge, on leaving the university he retired to his father's country house at Horton, Bucks. There he spent 1632-38 in arduous study, and wrote among other things the exquisite companion idylls, *L'Allegro* and *Il Penseroso*, 1633; the masque *Comus*, 1634; and *Lycidas*, 1637, an elegy on the death of his college friend, Edward King, which apart from its beauty is important because in it he first openly proclaimed adherence to the Puritan cause.

In May, 1638, he set out for the Continent, intending to spend at least three years abroad. But at Naples news reached him of civil commotion at home, and thinking it "base to be travelling for amusement" while his "fellow-citizens were fighting for liberty," he abandoned his projected tour in Greece and returned to England. Aug., 1639, to find the country on the verge of civil war. He was already meditating a great epic poem, but, laying this aside, devoted himself for 20 years almost entirely to politics and prose. His *Doctrine and Discipline of Divorce* appeared in 1643-45; *Tractate on Education* in 1644, the same year as his splendid vindication of the liberty of the press, *Areopagitica*. Immediately after the execution of Charles I he published *Tenure of Kings and Magistrates*, which established his position as the most eloquent apologist of the new regime, and he was appointed Latin secretary to the committee for foreign affairs. He continued to render assistance to the government by his *Eikonoklastes*, 1649; *Defensio pro Populo Anglicano*, 1651; and *Defensio Secunda*, 1654.

In 1652 his eyes, always weak, failed entirely and he became totally blind. Meanwhile his domestic life had been unfortunate. In 1643 he had married Mary Powell, daughter of an Oxfordshire royalist, but the union was unhappy. His wife died in 1653, and in 1656 he married Catherine Woodcock (d. 1658). Then the disaster of the Restoration drove him into

obscurity and left him an impoverished man. In his loneliness and sorrow he now turned to the poetic work which he had planned so many years before. *Paradise Lost*, "the epic of a lost cause," was published in 1667; *Paradise Regained* and *Samson Agonistes* in 1671. The principal prose works of these last years were a *History of Britain*, 1670; and a treatise *Of True Religion*, 1673. In 1663 he took as his third wife Elizabeth Minshull, whose affectionate care was some compensation for the undutiful conduct of the three daughters of his first marriage. Milton died in his house in Artillery Walk, Bunhill Fields, London, Nov. 8, 1674, and was buried in S. Giles's, Cripplegate. His widow survived him until 1727.

Milton has been described as "not only the highest, but the completest type of Puritanism," but while this may be true in respect of his personal character, as a poet he far transcended the limitations of his sect, for with the Puritan's zeal for righteousness he combined the scholar's love of knowledge and the artist's devotion to beauty. He was indeed a child of the Renaissance; his genius was inspired and enriched by its classic culture; and in form



Joannes Miltonus (John Milton)

After W. Faithorne

But while Milton's art and learning connect him with the Renaissance they are turned by him to the service of a Puritan philosophy of life; as notably in *Paradise Lost*, which, technically the finest example of the classic epic in modern European literature, has as its avowed purpose "to justify the ways of God to men." His supremacy among

Bibliography. Poetical Works, ed., D. Masson, new ed., 1890; Lives and Studies by D. Masson, 1859-80; M. Pattison, 1879; S. A. Brooke, 1879; R. Garnett, 1890; W. Raleigh, 1894; E. M. W. Tillyard, 1930; H. Belloc, 1935; M., Man and Thinker, D. Saurat, new ed. 1944; M. and the English Mind, F. E. Hutchinson, 1947.

Milton Abbey. A mansion and church in Dorset, England. About 7 m. S.W. of Blandford, it occupies the site of a 10th century Benedictine abbey and of the ancient town of Milton or Middleton. In 1752 the property was bought by Joseph Damer, later earl of Dorchester, who destroyed the town, transferring the inhabitants to the present Milton Abbas, pulled down the monastic buildings, except the abbey church and the monks' refectory, a large hall with a roof of Irish oak, and built the existing mansion in 1771 on the site of the abbey, from designs by Sir W. Chambers. The old town had a grammar school, at which Masterman Hardy, Nelson's captain, was a scholar.

The abbey church is a superb 12th-14th century structure, with Perpendicular tower, flying buttresses, and many beautiful windows. It has a 15th century altar screen, an oak tabernacle, and some ancient paintings and fine sculptures. Milton Abbey is the Middleton Abbey of Thomas Hardy's *The Woodlanders*. On an eminence near by is the little Norman chapel of S. Catherine, now restored as a place of worship.

Milvian Bridge, BATTLE OF THE. Fought Oct. 27, A.D. 312, at the bridge of that name, sometimes called the Mulvian Bridge, across the Tiber, between the forces of Constantine and those of Maxentius. Some time before the battle Constantine, it is said, had a vision, in which he saw in the sky the cross of Christianity, with the inscription: By this conquer. There is no reliable evidence as to the date when Constantine resolved to adopt a liberal policy towards Christianity, but it is certain that in the battle his soldiery fought with the Christian monogram as their badge. The battle resulted in the complete defeat of Maxentius, who himself was drowned in the Tiber. Constantine thus became master of the Western empire, and was able to promulgate in his dominions the policy of toleration towards Christianity.

Milwaukee. City and port of entry of Wisconsin, U.S.A., the co. seat of Milwaukee co. The largest city of the state, it stands on the W. shore of Lake Michigan, 85 m. N. of Chicago, and is served by the Chicago and North-Western and



Milton Abbey, Dorsetshire. The abbey church, restored in 1865, and the mansion erected on the site of the old monastic buildings

By courtesy of Country Life

his work belongs to the great Renaissance tradition; for *Comus* is a masque of the kind which Italian influences had made popular in the aristocratic circles of the time; *Lycidas*, a pastoral elegy in the manner of Theocritus and Bion; *Paradise Lost*, an epic fashioned closely on the models of Greek and Latin antiquity; *Samson Agonistes*, a tragedy of the severe Attic type.

English poets is beyond dispute; in intellect, imagination, and creative and constructive power he is without a rival; he is our greatest master of sublimity and the "grand style"; and if his Puritanism often makes him harsh and narrow, in loftiness of moral spirit he is still unsurpassed. See Chalfont St. Giles; English Language and Literature; *Paradise Lost*.

W. H. Hudson

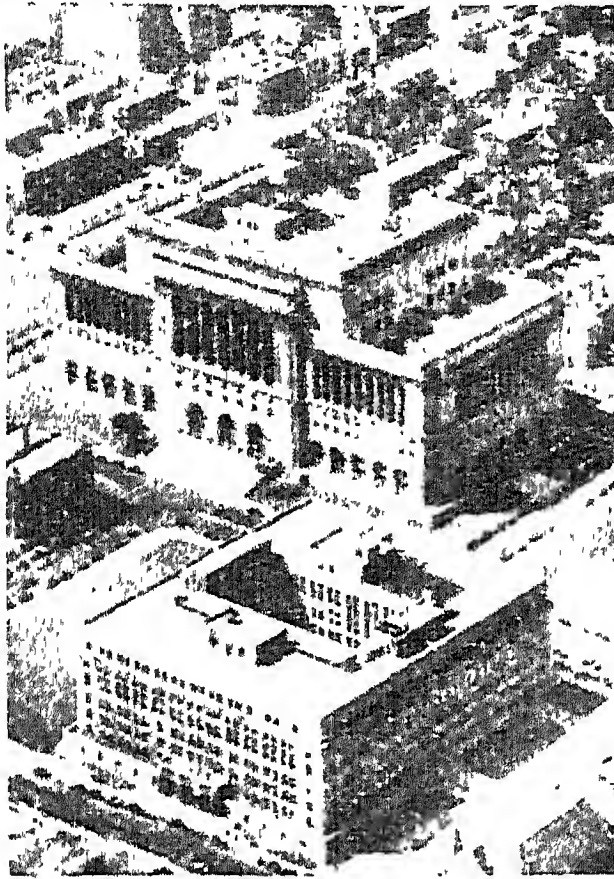
other rlys. The river Milwaukee and its tributaries, the Menominee and Kinnickinnie, which intersect the city, are navigable by large cargo and passenger ships, while an additional means of transport is afforded by the Great Lakes. The harbour is protected by breakwaters, its wharves extend for more than 20 m., and there is ample warehouse accommodation. Milwaukee ranks twelfth in population among U.S. cities and ninth in value of manufactured goods. Leading manufactures are metal goods, canned meat, and beer. In 1937, the city was debarred from further competition in health statistics among American cities, having received national awards regularly for 20 years. Early settlers were German emigrants from the 1848 European revolutions. A socialist mayor served continuously, 1916-40. Victor Berger, first socialist congressman, was sent to Washington in 1910, sentenced to prison under the espionage act during the First Great War, but regained his seat in 1922. Both Roman Catholic and Communist minorities have been active; these held the balance of power in 1946 in Milwaukee and combined to expel Robert La Follette, a famous liberal, from the U.S. senate by a vote of 9,000. Milwaukee, originally an Indian town, was visited c. 1760 by Alexander Henry. It was incorporated 1838, chartered as a city 1846. Pop. (1950) 637,392.

Mimamsa (Skt., investigation). Indian philosophical system of the Vedas (*q.v.*). It is divided into the Purva-Mimamsa and the Karma-Mimamsa, and the foundation of the doctrine is attributed to the teacher Jaimini. The text consists of about 2,600 *sutras*, or short concise axioms, arranged under various heads and chapters, the whole forming a criticism and interpretation of Veda doctrine, and touching many metaphysical and moral problems.

Mime OR MIMUS. Old form of dramatic play in vogue among the Greeks and Romans. It was a farcical, frequently coarse and indecent representation of incidents of real life, given as a popular entertainment at particular festivals. The Latin mime was described by Scaliger as a poem imitating any action to stir up laughter: the Greek form was in prose. The Greek mime originated in Sicily, its inventor being Sophron of Syracuse (c. 440 B.C.), who wrote in the Doric dialect. The Roman mimes were first put into literary shape by Laberius (105-43 B.C.) He was

forced by Julius Caesar to appear on the stage in one of his own characters, thereby losing his equestrian rank.

The ballet (*q.v.*) uses silent miming in combination with classical dancing. Modern themes, demanding less poetic and more rigorous and expressive form, make greater use of mime. See illus. Union Pacific, p. 890.



Milwaukee, Wisconsin. The Civic Centre of the American city

Mimicry. Term in zoology. Its meaning is the assumption of the characters of one animal (the model) by another individual or group of animals (the mimic). The majority of examples of the phenomenon occur among insects. The resemblance of one animal to another must be distinguished from the likeness of an animal to its surroundings, usually referred to as protective colouring. (See Colour: in Animals, p. 2445.)

The first scientific account of mimicry was given by Bates in 1862, in connexion with a group of butterflies of the Amazon valley, known as the Heliconinae, which are strikingly marked by yellow and black wings. This warning or sematic colouring has been copied by other butterflies of that region. Bates concluded that the models had offensive odours or tastes and were avoided by birds, lizards, and monkeys, whereas the mimic is frequently edible. This is often called Batesian mimicry, by which an edible, scarce, or feeble species adopts the appearance of a distasteful, abundant, or well-protected species. Other examples are the likeness of certain clear-winged moths to wasps and a cuckoo's egg to those of its foster parents.

Another type of mimicry is described by Müller (Müllerian

mimicry). He suggested that while young birds were gaining by experience a knowledge of distasteful objects, some individuals had to be sacrificed. If spread over two similar species, the experience could be obtained at a lower cost to each species. An example may be taken from the butterflies of the family of Heliconinae, of the genera *Ituna* and *Thyridia*, which are distasteful and have a common warning colouring. In this type of mimicry there is no deceit but a simplification of the lesson to be learnt by the potential predator.

Model and mimic must have the same geographical range; model must always be more numerous than mimic, otherwise the latter becomes a danger; and mimic and model must behave similarly in the presence of a predator. Tropical forests produce more examples of mimicry than other environments, because of their favourable conditions for insect life and the sharp fluctuations of light and shade.

The evolution of these mimicry patterns is a complex genetic problem, especially where it is obvious that some of the most elaborate mimetic adaptations are controlled by the action of a single gene. While this gene must have arisen spontaneously by mutation, it is fallacious to consider that the exact resemblance that it controlled did so too. A gene does not necessarily exercise the same effect on its first appearance in an animal as it does subsequently. Slow and apparently continuous modification of the mimic probably occurs by recombination and mutation of the whole gene complex, under the guidance of natural selection, whereby the most successful of the mimics survive.

A classic example in which the genetic situation has been elucidated is the polymorphic swallow-tailed butterfly *Papilio polytes*, which is widely distributed in the Orient. There are three female forms: *cyrus* resembles the non-mimetic male, *polytes* is an excellent mimic of *P. aristolochiae*, and *romulus* is very similar to *P. hector*. Where both models occur, e.g. in Ceylon, all three female forms are found; where *P. hector* is absent, e.g. in Hong Kong, so is *romulus*. A single sex-controlled dominant factor converts *cyrus* into *polytes* and another similar factor converts *polytes* into *romulus*, provided always that the first factor is present. See Darwinism; Genetics; Insect. Consult Mimicry, G. D. H. Carpenter and E. B. Ford, 1933.

E. R. Trueman

Mimir. In Norse mythology, guardian of the fountain of wisdom in the lower world. Odin purchased a draught from the fountain with one of his eyes, and thus was enabled to spread wisdom among men. Mimir was a hostage given by the Aesir to the Vanir, who beheaded him; but Odin uttered spells over the head that it might still advise him.

Mimnermus (fl. c. 620 B.C.). Greek lyric poet. A native of Smyrna, he was the first to use elegiac verse regularly for the themes of love and lament. Fragments only of his work survive.

Mimosa. Large genus of herbs, shrubs, and trees of the family Leguminosae, chiefly natives of America. The leaves are twice divided into small leaflets, and are often sensitive, folding up at a touch, or under atmospheric changes. The small yellow flowers are closely packed in round heads or cylindrical spikes. The mimosas are frequently confused with the Australian wattles (*Acacia*), but no species of mimosa is a native of Australia.

Mimulus. Genus of annual and perennial herbs of the family Scrophulariaceae. The musk (*q.v.*) is the best-known species. Another is the monkey flower, with large tubular yellow blooms, sometimes with crimson blotches. They are natives of America, Asia, E. Africa, and Australia, and were introduced into Britain in 1826.

Min. Egyptian deity. He was the god of fertility and of the desert routes, especially worshipped at Coptos and at Akhmim, whose Greek name Panopolis is due to his identification with Pan. Petrie's Coptos excavations, 1894, revealed three limestone colossi of

the god, perhaps the oldest Egyptian statuary. He was usually portrayed tightly swathed and wearing the double plume, his right arm holding a flail.

Min. Name of two rivers in China. One is a tributary on the left bank of the Yang-tse, which it joins near Suifu. It rises in the N. of Szechuan prov. at an elevation of 13,000 ft., and is navigable for 200 m. The other river is in Fukien prov. Including the longest of its three headstreams, it is 350 m. in length. Foochow is situated on it. Owing to the bar at the mouth, large ships can only enter the river at high tide. See China; Foochow.

Mina. Ancient Greek weight and money of account, varying in Asia Minor and different parts of Greece. Though not coined, the money of account equalled one-sixtieth of a talent and was worth between £3 and £4.

Mina OR MYNAH (*Gracula religiosa*). Passerine bird of Southern India, sometimes called the grackle or grakle.

About the size of the English black-bird, glossy black in colour, with purple, violet, and green iridescence, it has a white patch on the quill feathers of the wings, a curved orange bill, yellow legs, and behind the eye a naked, fleshy yellow excrescence which joins the top of the head. There is also a bare patch below the eye. Minas are described as fruit-eaters, but are very familiar from their habit of visiting verandahs for the purpose of feeding upon the insects that shelter there. They are easily tamed, and in addition to their natural whistling capabilities can be taught to pronounce words quite distinctly.

Minaret. Term used for a slender tower of moderate height, with one or more balconies, from which Mahomedan priests summon the people to prayer at certain hours. See Mahomedan Architecture.

Minas. Town of Uruguay, capital of Lavalleja dept., also once called Minas. It is 70 m. N.N.E. of Montevideo, and was founded in 1784; it makes fine sweetmeats. In the vicinity are marble and granite quarries. Pop. (est. 1956) 25,000.

Minas Geraes OR MINAS GERAIS. State of S.E. Brazil, bounded N. by Bahia, S. by Rio de Janeiro. Second in population and fifth in size of the states of Brazil, it is

watered by the São Francisco, the Parahyba, their tributaries, and many other rivers. Mainly a forested plateau, with an alt. of 2,000 ft., it is traversed by the Sierra do Mantiqueira and the Sierra do Espinhaço, and contains Mt. Itatiaya. Manganese, gold, diamonds, and other precious stones, coal and iron are found, but not extensively worked. The chief industries are stock-raising and agriculture. The principal products are coffee beans, sugar, tobacco, cotton, rice, potatoes, cheese, and butter. Ouro Preto was the capital until 1897, when it was supplanted by Belo Horizonte. Area 224,700 sq. m. Pop. (1950) 7,717,792, including several thousand Botocudo Indians.

Minbu. Dist. and river port of Burma, on the Irawadi. The dist. lies between the Irawadi and the Arakan Mts. Rice and oil seeds are the chief crops. The port is on the right bank, almost opposite Magwe in the lower section of the river, where there is no rly. Dist., area 3,302 sq. m.; pop., 302,373. Town pop. 6,700.

Minch. Name for parts of the channel E. of the Outer Hebrides, Scotland. It consists of the Minch and the Little Minch. In the N. the Minch varies from 20 to 45 m. in width; the Little Minch, W. of Skye, being from 15 to 20 m. wide. The channel is a rift valley.

Minchinhampton. Town of Gloucestershire, England. It is 4 m. S.E. of Stroud, and 12 m. S. of Gloucester. It is now chiefly residential, though one mill remains as a relic of the formerly prosperous cloth industry. The chief church is Holy Trinity, dating in part from the 13th century. From Minchinhampton Common, 660 ft. high, a fine view of the Cotswolds is obtained.

There are two golf courses. Population (estimated) 3,500.

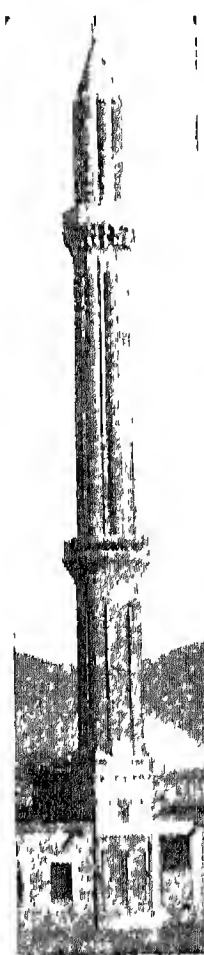
Mincing Lane. London thoroughfare. Between Rood Lane and Mark Lane, it connects Great Tower Street with Fenchurch Street, E.C. Before it was half demolished by German bombs in 1940-41, it was a centre of the tea and rubber trades. Here was the hall of the Clothworkers' Company



Mimosa. Flowers and leaves of this American shrub



Mimulus. Leaves and flowers of musk, *Mimulus moschatus*



Minaret or tower of Mahomedan mosque

(*q.v.*), the garden of which, containing the tower of the old church of All Hallows Staining, was formed from the churchyard of that building. The body of the church was demolished in 1870, when its monuments were removed to S. Olave's, Hart Street. The lane is named after houses which belonged to the *mynchens*, or nuns, of S. Helen's.

Mincio. River of N. Italy. Issuing from the S. end of Lake Garda, it flows S. and S.E., joining the Po 10 m. S.E. of Mantua, up to which it is navigable, after a course of 116 m. Near its banks several battles were fought: Castiglione, 1796; Solferino, 1859; and Custozza, 1848 and 1866.

Mind. In general, the opposite of matter, more particularly, the thinking part of man, the cognitive faculty which is mainly concerned with intellectual processes. In this sense it is contrasted with soul (*q.v.*), which is mainly concerned with the various forms of feeling, volition, and emotion. The word *nous* (mind), as used by the Greek philosopher Anaxagoras in the sense of the arranging principle of the world, involved the idea of consciousness and design. The same idea appears to some extent in the monads of Leibniz. According to the modern definition, mind is a collective term, denoting the sum-total of all mental processes, which are themselves only different functions of the nervous system, especially of the brain.

In regard to the relation between mind and body (matter), there are three principal hypotheses. Dualism (*q.v.*) regards the mind as a substance existing side by side with, and independently of, the body. Its supporters argue that the essential characteristics of matter are extension, change, and movement in space, and it has never been shown how mental phenomena, the characteristics of which are unity and identity, can be produced from movement and change.

Materialism (*q.v.*) regards mental phenomena as mere bodily functions, like the digestion of food. But it is difficult to see how thought (consciousness) can be reduced merely to this, for the movements which take place in the body remain unconscious, whereas men themselves are conscious of their thoughts. The most we can say is that thought is no doubt connected with certain functional movements of the brain which are necessary to it under present conditions; but, though connected with these functions, it

is yet distinct from them. The materialist, however, argues that it is difficult to conceive a satisfactory positive notion of an intellectual substance, not merely regarding it as the negative of body. Idealism (*q.v.*) sees in bodies and external phenomena only the manifestations of intellectual beings; mind is the reality, all else is derived from it, or is appearance.

The object of mental philosophy is to arrive at a unitary conception of the aggregate of mental phenomena; but whereas the individualistic theory assumes a plurality of independent intellectual parts, by the cooperation of which a unity of the intellectual life of the world is produced, universalism regards this unity as prior in time, and the different intellectual phenomena as manifestations of a universal world spirit.

Mindanao. Second in importance and size of the Philippine Islands. Irregularly shaped, with a long peninsula stretching out to the W., its main portion measures about 300 m. from N. to S., and 150 m. from E. to W., while it has an area of 36,537 sq. m. It is almost cut into two parts by the bays of Iligan on the N., and Illana on the S. of the peninsula, and its shores are indented by other bays.

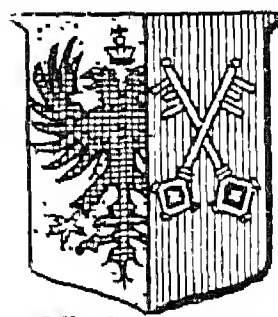
The surface is in general very mountainous, the loftiest summits being the active volcanoes of Apo, 10,312 ft., and Malindang, 8,562 ft. Most of the rivers are small, but the Agusan and the Rio Grande de Mindanao traverse the greater part of the island. Lakes are numerous. The climate is hot, and the rainfall heavy, the annual fall often exceeding 100 ins. The island is subject to earthquakes, a disastrous visitation in 1897 causing much damage, including the destruction of the town of Zamboanga, since rebuilt. Hemp and copra are the chief products. Timber is largely obtained, minerals are worked to some extent, and cattle rearing is carried on. The inhabitants, who number 560,000, are mostly of Malay stock, about one-third being Christians, and the majority of the remainder Mahomedans.

Japanese forces began the conquest of the Philippines in Dec., 1941, and attacked Mindanao on Dec. 20, making landings at Davao. In March, 1942, there were further landings at Zamboanga, the small garrison withdrawing into the interior of the island. Davao and the airfields on Mindanao were attacked by U.S. aircraft in 1944; but the island, heavily prepared by the Japanese for defence against

attack, was bypassed when U.S. landings were made on Leyte in October. On March 3, 1945, U.S. troops landed on Mindanao and advanced towards Zamboanga, meeting with little opposition. Davao was recaptured on May 5, and by the end of the month the remaining Japanese troops were contained in a small area in the centre of the island, where they continued to resist until Japan surrendered in August.

Mindel. In geology, the second of the four major glacial phases recognized in the Alps. These phases, Gunz, Mindel, Riss, and Würm, are separated by interglacial periods, when the glaciers retreated to approximately their present position.

Minden. Town of W. Germany, a district capital of N. Rhine-Westphalia. It is on the river



Minden arms

Weser, in hilly country some 40 m. W. of Hanover, on the Berlin-Cologne rly, and the great Midland canal. Originally a Roman settlement, seat of a bishopric from the time of Charlemagne until 1634, it founded, with Munster and Osnabrück, the Westphalian league of cities. It came under the rule of Prussia in 1648. It was the scene of a famous victory of British and allied Hanoverian and Brunswick forces over the French in 1759. (See Minden, Battle of.)

The town had a remarkable early Gothic cathedral (13th cent., with portions dating from 1065), S. Mary's (1022-36), S. Martin's (11th and 12th cent.), very severely damaged in the Second Great War. The Gothic town hall (13th) was gutted, the arcade alone surviving. Minden's industry produced chemicals, machinery, cigars, textiles, furniture, meat, and preserves; boat building, iron founding, and inland shipping were other trades flourishing. The town was cleared April 5, 1945, by the British 6th airborne div.; after Germany's surrender it lay in the British zone of occupation. Pop. (1950) 37,050.

Minden, BATTLE OF. Fought between the British, with their Hanoverian allies, and the French, Aug. 1, 1759. Under Ferdinand of Brunswick, a British and Hanoverian army was operating in N. Germany. Defeated at Bergen in April, it fell back before the French, who occupied Minden in July. To retire farther would have been to leave Hanover to the

mercy of the French, so Ferdinand decided to fight.

The French army, 60,000 strong, commanded by Contades, occupied a strong position to the S. of Minden, the Weser protecting one flank, and a morass the other. The British and their German allies had 52,000 men, and the engagement began when 7,000 of them were sent to cut the enemy's communications with Kassel. The French met this threat by ordering a general attack, which was anticipated by Ferdinand, who moved more troops into the threatened position, while six English, followed by three Hanoverian, battalions advanced to the attack.

In two lines they marched steadily across the plain, swept by a cross-fire from both flanks, until they were charged by the French cavalry, which they routed with a most destructive fire at close quarters. The battle was won, and the French army fell back to Minden. Lord George Sackville refused to advance with his cavalry, thus enabling the French to retreat in fairly good order. The French lost 7,000, and many guns and colours. The allies lost 2,600, half being British, of whom about 10,000 were on the field.

The Minden regiments were 12th, Suffolk; 20th, Lancashire Fusiliers; 23rd, Royal Welch Fusiliers; 25th, King's Own Scottish Borderers; 37th, Hampshire; 51st, Yorkshire Light Infantry.

Mindoro. Seventh in size of the Philippine Islands. S. of Luzon, from which it is separated by Verde Island Passage, 7 m. broad, it is 100 m. long by 60 m. broad; area 3,579 sq. m. It is mountainous, rising in Mt. Halcon to about 8,850 ft., and extensively wooded. Calapan is the capital.

Mindszenty, JOSSEF. Hungarian name adopted in 1945 by Joseph Pehm (b. March 29, 1892), a Hungarian R.C. cleric ordained in 1915. As a village priest, he was arrested by the communists during the short-lived soviet regime of 1919. In 1944, now bishop of Veszprem, he was arrested with 27 priests of his diocese by the Nazis of his country. Released by the Russian conquest of Hungary, on Oct. 7, 1945, he was installed primate of Hungary; in 1946 he was created a cardinal; and in 1947 visited the U.S.A. For a time his resistance to the Nazis put him in high favour with the new Communist govt., but his steady opposition to it led to his re-arrest on Christmas Day, 1948, on a number of charges—among them

that he was plotting for the restoration of the Archduke Otto, and had acted as a spy for the Western powers. Shortly before his arrest Mindszenty had addressed a letter to the bench of bishops of Hungary in which he said, "I have taken part in no conspiracy. I will not resign my episcopal see. I will make no confession. If, after this, you should hear that I have confessed or resigned, and that this is authenticated by my own signature, consider it to be only the consequence of human frailty. In advance I declare it null and void."

When he was brought to trial on Feb. 3, 1949, the president of the court read a letter in which the cardinal was said to confess his "essential guilt" and, questioned in court, he admitted the accusations against him, though he placed a different construction on his intentions from that given them by the court. He was condemned to life imprisonment. Released by the revolutionaries on Oct. 30, 1956, when the revolution was suppressed by the Russians he took refuge in the U.S. embassy at Budapest.

Mine. Sea and land weapon of war. It consists of a charge of high explosive in a metal or other container detonated by a fuse actuated by impact, pressure, electric impulse, magnetism, or sound waves.

NAVAL MINES. These were first used in 1573 at the siege of La Rochelle, and consisted of small barrels of gunpowder fitted with a burning fuse and allowed to drift with the tide against the investing ships. Similar mines were used by Gustavas Adolphus in 1630. These early mines were generally ineffective, as were the moored type used by the colonists in 1777 to protect certain of their ports during the war of American Independence. Mechanically-operated mines were used by the Russians in the Black Sea operations of the Crimean war, but achieved very little success.

In 1839 Pasley invented an electrically-operated mine, and by the middle of the century such mines had been adopted by most maritime nations. Called controlled or observation mines, they were suspended some feet below the surface of the water and were used mainly for defending harbours. Fired electrically from the shore, they were detonated by the closing of a switch. This type of mine destroyed nine warships in the American Civil War, 1861-65, and took heavy toll of shipping in

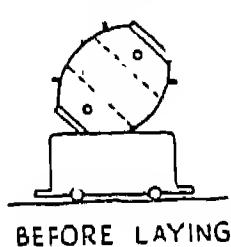
the Franco-Prussian war, 1870-71, the Russo-Turkish war, 1877-78, and the Spanish-American war, 1898.

Controlled and observed minefields defending British naval bases reached a high degree of efficiency in the First and Second Great Wars. The shore station controlling this type of minefield is equipped with a chart of the minefield superimposed on a glass screen; each mine is in electrical contact with the screen, and when a hostile ship moves in the vicinity its course is registered by a spot of light crossing the screen. When the light passes the first barrier of mines, a firing key is pressed and one or more mines near the ship are exploded. A breakdown in the controlled minefield at Scapa Flow permitted a German submarine to enter and sink the battleship *Royal Oak*, Oct. 14, 1939.

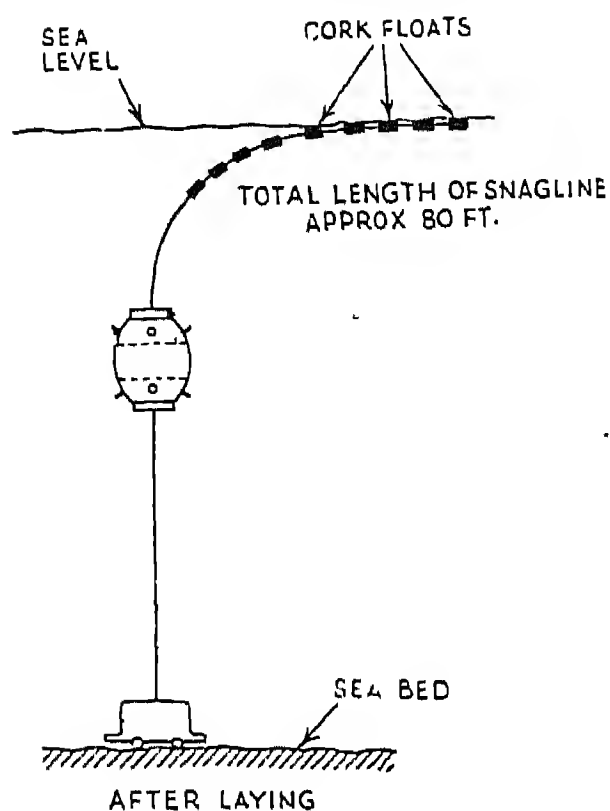
In 1900 the British navy began large-scale development of contact mines. The early types were fired on impact by means of a mercurial contact-maker and a primary battery, but proved uncertain in action. As in all hollow, submerged vessels, the mine chamber was excessively damp, causing rapid discharge of the battery, while the mercury of the contact-maker oxidised and failed to function. In the Russo-Japanese war of 1904-05, contact mines sank a number of warships, but they were liable to rapid deterioration owing to the action of sea-water. In 1915 the British navy designed a mine in which the activating liquid was contained in sealed glass tubes placed in lead horns projecting outside the mine chamber, thus preventing the damp atmosphere of the chamber from exhausting the battery.

The most common naval contact mine consists of a barrel-shaped buoy 3 ft. in diam. and weighing 650 lb. (Fig. 1). One half of the interior is occupied by the air chamber which keeps the mine buoyant, the other is filled with 500 lb. of T.N.T. From the top of the mine casing project the half dozen lead horns enclosing the glass tubes containing the activating liquid for the detonating battery. Immediately one of the tubes is broken by the impact of a ship, the chemical pours down upon the battery, which then explodes the mine. Sometimes the mine's radius of action is extended by having attached to one of its horns an 80-ft. rope, called a snag-line (Fig. 1). When a ship fouls the cable, the mine is fired.

Attached to the base of the contact mine is a sinker, which holds the mooring cable wound on a reel.



When the mine is dropped from a laying vessel, a plummet falls from the sinker and automatically



Mine. Fig. 1. Buoyant or moored mine: (upper diagram) resting in wheeled launching trolley which also acts as sinker and mooring device; (lower diagram) attached to a sinker, on sea bed, and floating below water level, with snagline on surface

Courtesy of Discovery

releases the mooring cable, which pays out and allows the mine to rise. Immediately the plummet touches the sea bed, the cable is locked on its reel, and the weight of the sinker drags the mine down to the required depth. Moored mines can be laid to any depth down to 100 fathoms (600 ft.) in tidal waters, and to considerably greater depths where the waters are tideless. Deep-laid mines are used against submarines, shallow-laid mines against surface craft.

Transporting and laying mines is a specialised branch of naval work and is done from vessels designed for the purpose. At the outbreak of the Second Great War the Royal Navy had in commission one large minelayer of 7,000 tons and some 20 smaller layers averaging 800 tons each. As hostilities proceeded, the fleet was greatly expanded by new construction and conversions. Every class of naval or merchant vessel from a battleship to a trawler can be, and has been, used for minelaying. The average naval minelayer releases 300 mines on one voyage.

Mines are stowed in the layer resting on their sinkers, which have wheels on their bases and run on rails laid fore and aft of the ship's

deck. The mines are trundled along the rails until they reach the mine traps, a series of ports cut in the vessel's stern. There they are held by "dogs" until the traps are opened, when they run down the curved ends of the rails into the sea. Submarines are frequently used as minelayers, the largest stowing about 50 in the bow and stern torpedo tubes; submarines can release mines while submerged. In 1917 the Allies closed the Heligoland Bight with 16,000 mines laid by a flotilla of submarines. In the Second Great War, submarines laid mines off Axis-occupied ports in Europe and N. Africa. Large numbers of sea-mines were also laid from aircraft, though the number that can be carried by an aeroplane is small.

During the First Great War, over 250,000 moored contact mines were laid by the various belligerents and caused more losses at sea than any other weapon except the torpedo. Some 172,000 were laid by the Allies in the English Channel, the North Sea, and the Baltic. On the other hand, the British blockade prevented the Germans from laying more than 43,000 mines, 50 p.c. of which were removed by Allied sweepers.

In the First Great War the risk of ships being sunk by moored contact mines was considerably reduced by equipping them with a self-protecting device consisting of a cable stretching from the bow to paravanes on either side. The paravanes were shaped somewhat like an elongated pear, and were set with a steering mechanism which kept the cable well spread away from the ship. As the cable came in contact with the mine's mooring wire, the danger ahead was indicated, and the ship could avoid it by altering course.

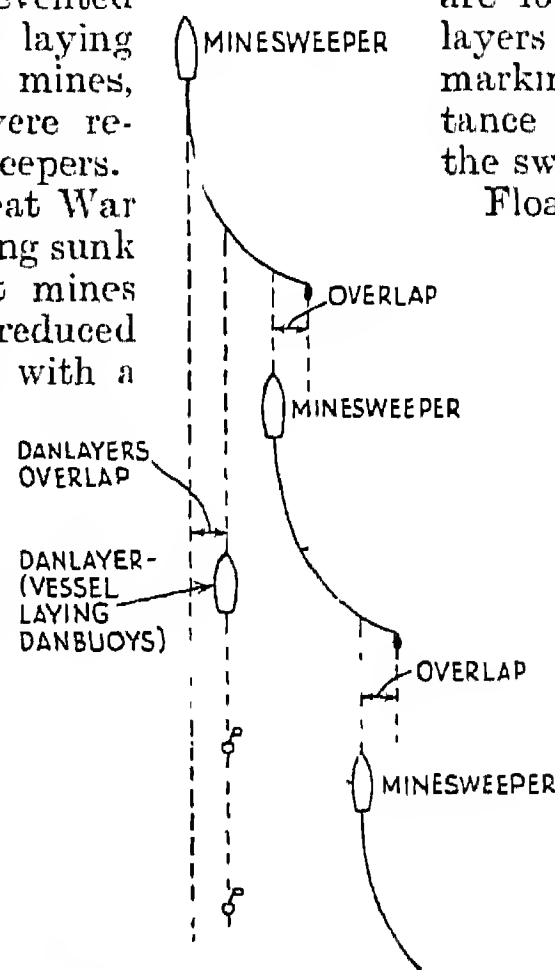
Minefields were swept by vessels equipped with Oropesa sweeps, so called after the name of the trawler in which they were first tried during the First Great War. The Oropesa sweep consists of a kite and kite wire, a sweeping wire, an otter, and a float. The kite and the otter both comprise a square

metal frame with transverse inclined planing surfaces. Kite and otter are attached by cable to the sweeper in such a way that the kite surfaces are horizontal and those of the otter vertical. The sweep wire, fitted with cutting edges or small explosive charges for severing mine moorings, is towed by the kite wire. The kite takes the sweep down to the required depth and keeps the in-board end of the sweep in the track of the minesweeper. The otter is supported at the desired depth by the Oropesa float, and is so slung that it sheers well away from the minesweeping vessel and gives spread to the sweep wire. When the sweep wire cuts the mine's mooring cable, the mine floats to the surface, where it is sunk by rifle fire.

Each sweeper pays out 600 yds. of sweep wire and sweeps a lane 250 yds. wide according to the tide. Sweepers work in flotillas and maintain a staggered formation, so that the following vessels steam well inside the swept lane of the preceding sweeper. The sweepers

are followed by dan-buoy layers which drop a line of marking buoys some distance within the edge of the swept channel (Fig. 2).

Floating mines are somewhat similar to the moored type, except that they are unanchored and drift with tides and currents. They are used for attacking ships sheltering in a harbour by allowing the tide to drift them in, or are dropped in the wake of a ship or squadron by a ship that is being chased. The floating mine is slightly heavier than the water it displaces and therefore sinks slowly. On passing the pre-arranged depth, a hydrostatic valve switches on elec-

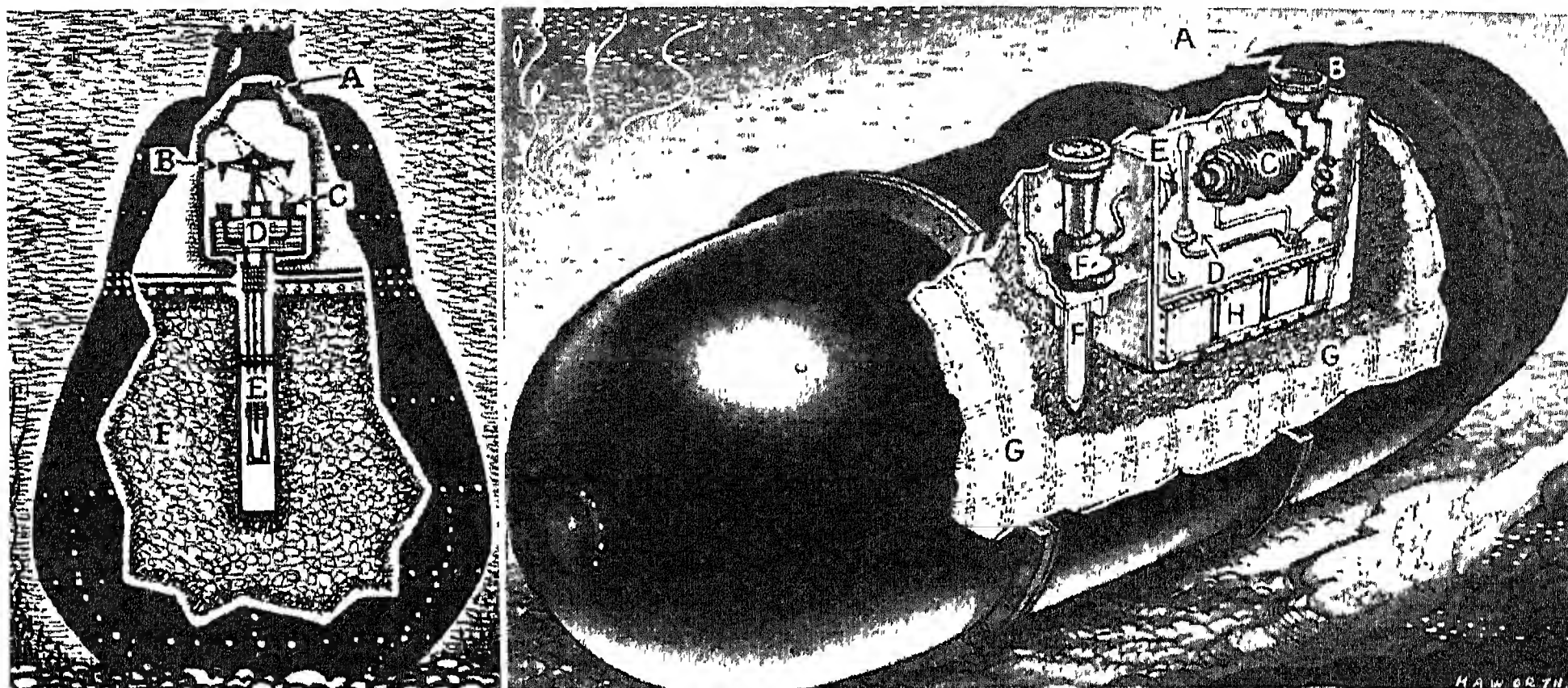


Mine. Fig. 2. Sweeping moored mines. The vessels, equipped with Oropesa sweeps, steam in echelon, so that the swept lanes overlap. The limits of the swept areas are marked by vessels placing dan-buoys well within the limits

Courtesy of Discovery

trical power which drives a propeller on the bottom of the mine and causes it to rise until at a certain depth the power is automatically switched off and the mine begins to sink again.

By the Hague Convention, floating mines should become inactive one hour after they have been set adrift. International law also



Left, magnetic mine. When a steel ship passes over the mine it attracts upwards the small balanced magnet B until the opposite end is forced down and closes an electric circuit at C. A weak current is induced and, strengthened by the relay D, fires the detonator E, which ignites the explosive charge F. The mine remains harmless until the

seal A has dissolved. Right, acoustic mine. Sound waves, A, generated by a ship's propeller are picked up by the hydrophone B, and vibrate the trembler C, and the electromagnet D, supplied by battery H. When sound waves reach a specific intensity, the trembler contacts E, closing the circuit which fires detonator F, so igniting charge G.

Mine. Fig. 3. Sectional diagrams of the magnetic and acoustic types

requires that moored mines coming adrift must automatically be rendered harmless; this is usually done by means of a switch which floods the mine and causes it to sink immediately its mooring cable snaps. The Hague Convention further provides that moored minefields may be laid only to protect harbours, bottle-up an opposing fleet, or confine shipping to narrow unmined channels where they can be most conveniently handled for contraband control. Moreover, the position of all permanent minefields must be announced by the laying power, and patrols must be maintained to prevent shipping of neutral countries from moving into mined areas.

It was because of the comparative ease with which a moored minefield could be swept by an enemy enjoying naval superiority that the Germans developed the static, or ground, sea mine in the Second Great War. A ground mine is one which rests on the sea bed and remains inactive until it is detonated by the pressure, acoustic or magnetic influence of a passing ship. Size for size and charge for charge, a ground mine is much more destructive in effect than a moored or a floating mine. Not only is the velocity of detonation very great, but the explosion gives rise to an enormous pressure impulse, which reaches the surface of the water in the form of a huge bubble of gas travelling at the speed of sound. Secondary pulses from the expansion and contraction of the bubble contribute to the destructive effect. This pressure

impulse is greater when the mine is laid on a hard sea bed than when on soft sand; the latter absorbing some of the explosion.

The first ground mine used in the Second Great War was the magnetic mine (Fig. 3) dropped from a German aircraft off Shorncliffe in Oct., 1939. The mine consisted of a metal cylinder fitted with 700 lb. of T.N.T., and with a magnetic detonator actuated by the permanent magnetism induced in a ship's hull by the hammering that takes place during its construction. The detonating mechanism consisted of a magnetised dip-needle enclosed in a sealed container. The seal dissolved shortly after the mine was laid and the needle was wound by a helical spring until it lay horizontal, with one end free and the other suspended over an electrical contact. When a ship passed over the mine, the free end of the balanced magnetised needle was attracted upwards until the opposite end was forced down to complete the electric circuit which fired the explosive charge. In order to prevent the explosion of one magnetic mine detonating others in the vicinity, a pendulum mechanism broke a circuit when the mine received a shock. Owing to the comparatively short distance which must exist between ship and mine for the latter to be fired, magnetic mines were always laid in fairways and other shallow water.

Ships were given individual protection against magnetic mines by the device called degaussing (*q.v.*), while the mines themselves were

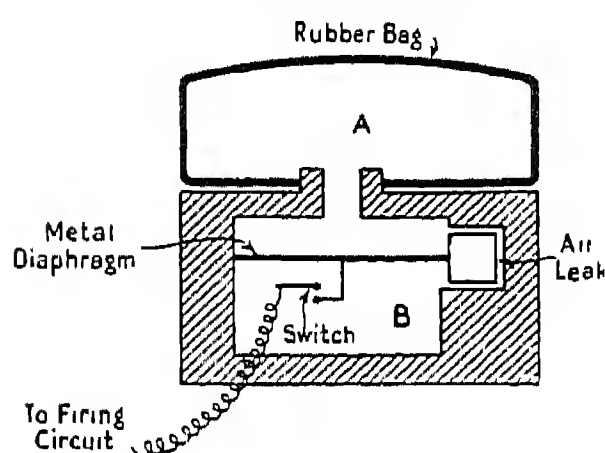
swept by a variety of means. The most efficient magnetic-mine sweeper consisted of a degaussed vessel towing two 500-yd. lengths of self-buoyant electric cable. Periodically, a current of 2,700 amps. was passed through an electrode at each end of the cable, thus creating a magnetic field which fired the mines over a wide area. For sweeping narrow channels in very shallow water, the towed skid was used, consisting of a raft carrying a large solenoid and towed by a degaussed motor boat. Current supplied from the towing vessel passed through the solenoid and induced a magnetic field which exploded the mines. Some success in sweeping these mines was achieved with Wellington bombers equipped with a ring of copper extending under the wings and from nose to tail. A heavy electric current passing through the ring created a magnetic field capable of setting off the mines provided the aircraft flew sufficiently low.

In 1940 the British introduced an improved type of magnetic mine which was extremely difficult to sweep. Fitted with a period-delay mechanism, it had to be swept over at least 12 times before it was detonated by the sweepers' strong magnetic field; on the other hand, it was immediately fired by the weaker field of an ordinary ship.

Acoustic mines (Fig. 3) were used by both sides in the Second Great War. When the sound waves from a ship's propeller reached the mine-casing, vibrations were set up

on the casing which were transmitted to a contact arm inside the mine and in "tremble" contact with the case. The vibrations caused the contact arm to oscillate and close an electric circuit which operated a relay to detonate the fuse and fire the charge. German acoustic mines were swept by vessels carrying an electrically-driven hammer in a steel box fitted some distance beyond the bows. The intense noise thus produced detonated acoustic mines some distance ahead of the ship. The British acoustic mine was virtually unsweepable as it incorporated a supersonic detector which could distinguish between the vibrations of a propeller and of a hammer.

One of the German defensive measures against the Allied landings in Normandy, June, 1944, was



Mine. Fig. 4. Pressure unit of a German acoustic mine (naval). Pressure created by water displaced during the passage of a ship compresses the air-filled rubber bag A, which forces air into the chamber B. As the air returns through the air leak, the metal diaphragm is lifted upwards, closing the contact switch and causing an electric impulse to flow through the firing circuit to detonate the charge

Courtesy of Discovery

the pressure mine (Fig. 4). This consisted of a large version of the anti-tank mine (*v.i.*) filled with some 500 lb. of T.N.T. and surmounted by a rubber bag filled with air. When a ship passed over the mine, the water pressure between ship and bag was increased, so causing the air inside the bag to be forced downwards into an air chamber; as the air returned through an air leak it lifted up a thin metal diaphragm, which pressed against an electrode and, completing an electric circuit, fired the charge. The pressure mine had been invented, but not used, by the British Admiralty some years previously, so that it was comparatively simple to institute protective measures. As the pressure exerted by a ship depends on its speed, vessels were relatively safe if they moved slowly over pressure-mine areas. As these mines were laid in very shallow water, they were removed by divers

Throughout the Second Great War, Britain laid 263,088 mines, of which 56,300 were laid by aircraft of all types, including 47,250 by Bomber Command. Resultant casualties to the enemy were 1,047 warships and merchant vessels sunk and 541 damaged; 251 German sweepers were lost while clearing British mines, and a force of 30,000 officers and men was continuously employed mine-sweeping in the Baltic and off ports in occupied Europe. Britain used 1,533 vessels for sweeping German mines and lost 263 sunk; the total minesweeping personnel was 57,000. For some years after the war, flotillas of British sweepers were engaged in clearing the navy's defensive minefields; German minefields were cleared by German sweepers and crews commanded by British officers.

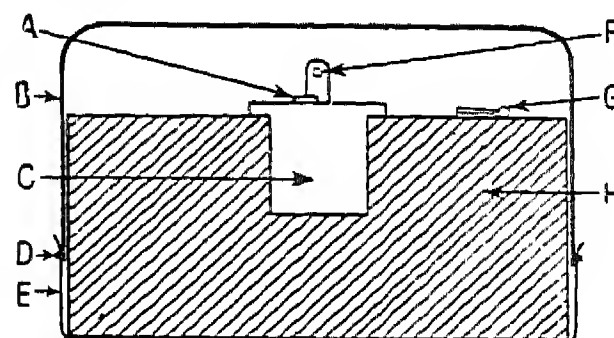
Of the 2,426 British merchant ships lost during the war, 296, totalling 816,255 out of 11,352,933 tons, were sunk by mines.

MILITARY MINES. Until the large scale use of the tank in the latter stages of the First Great War the military mine was a tunnel driven towards the enemy's defences in order to lay an explosive charge. Such offensive operations had been practised from very early times, and reached a high development in the First Great War; notably at Messines Ridge on June 7, 1917, when a series of mines containing a total of 450 tons of explosives was exploded simultaneously over a front of 7 m.

With mechanisation and consequent mobility, there were few opportunities for using tunnelled mines, and the military mine came to mean the defensive and delaying weapon rapidly developed in the Second Great War. All the belligerent armies used vast numbers of these mines, which were divided into two main types, anti-personnel and anti-tank. The anti-personnel, or jumping, mine consisted of a cast-iron, open-topped container having fixed to its inner base a ballistite cartridge. Resting on the cartridge was a second container filled with some hundreds of small steel balls surrounding a central core of explosive. Projecting from the top of the inner container were two or more antennae of thin but rigid metal connected to a firing pin in contact with the ballistite cartridge. The mine was buried in the ground so that only the antennae protruded.

Pressure of a man stepping on the antennae fired the ballistite cartridge, which discharged the

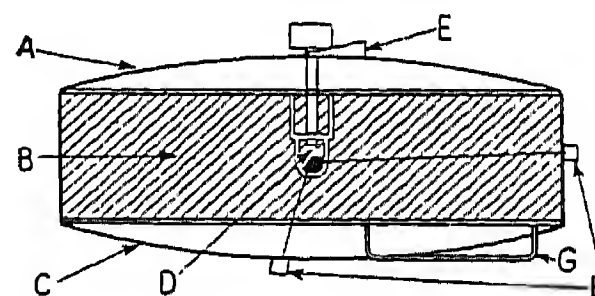
outer container some six feet above the ground. As the container left the inner casing, a trip actuated a fuse which in turn detonated the core of explosive and scattered the



Mine. Fig. 5. British Mark V anti-tank mine. Pressure of a vehicle passing over the top plate B forces down the firing pin F, which, cutting the shear wire A, fires the detonator C, so firing the charge H. E is the bottom of the case containing the charge, and G the safety pin which is inserted in the hole on top of the firing pin, so rendering the mine safe for transport; D is the housing for anti-lifting device

steel balls over a radius of some 200 yards. When time permitted and the ground was suitable, the mines were joined by trip wires attached to the antennae and lightly covered with earth; when a trip wire was disturbed a number of mines detonated simultaneously. The only effective method of breaching an anti-personnel mine-field was to drive a tank through it, as the mines were ineffective against armour plating.

The principal anti-tank mines of the Second Great War were the British Mark V (Fig. 5) and the German Teller (Fig. 6). The Mark



Mine. Fig. 6. German Teller anti-tank mine. Pressure of a vehicle passing over the top plate A forces down the firing pin E, which explodes the detonator D, so igniting the charge B. C is the bottom, or base plate; F, anti-lifting device housings; G, lifting handle

V consisted of a lower, circular case of metal 8 ins. in diam. and filled with 8 lb. of explosive charge. Set in the centre of the explosive was a detonator connected to a firing pin fixed to the top of the case. Resting on the firing pin was a circular lid which acted as a pressure plate. The total height of the mine was 5 ins. The Teller mine, which worked on a similar principle, contained 11 lb. of H.E. and was 12 ins. in diam. and 3 ins. high. Anti-tank mines were buried just below the surface of the ground, and the pressure of any

vehicle, even a motor-cycle, passing over the pressure plate forced the firing pin down and exploded the charge. In normal ground the explosion made a crater up to 5 ft. in diam. and would blow off the track of a tank.

For the mining of roads, box mines were used, the most efficient being the German Hoelst. It comprised a long narrow box, 4 ft. long, 18 ins. wide, and 18 ins. deep. The lid acted as a pressure plate and forced down one or more firing pins which detonated a charge of 15 lb. of T.N.T. The mines were buried just below road level and verges in echelon, so that four or five effectively covered approaching traffic. Road mines were designed not only to destroy or disable the vehicle detonating them, but also to crater the road sufficiently to prevent its use by following traffic.

When used on open ground anti-tank and anti-personnel mines were normally laid in checkerwise rows, with an interval of five yards between mines and five yards between rows. An anti-tank minefield a mile wide and 500 yards deep contained 35,000 mines. Where a minefield was laid to defend a position and not merely to cover a retreat, it was protected by a screen of artillery and machine-guns to prevent enemy clearance parties from breaching it.

Various devices were used for the detection of mines, the most successful being the Polish sonic detector and the Russian magnetic ring. The Polish detector, which was the standard detector of the Allied armies, consists of a 6 ft. bamboo pole, having at one end a flat fibre plate fitted with two magnets. The magnets are connected by a cable through the pole to an oscillator carried by the operator, who wears headphones connected to the oscillator. When it is switched on, the oscillator emits a note of constant pitch, which alters immediately the magnets pass over buried metal. The spot on the ground was then marked by a white metal cage, and the mine lifted and disarmed by hand. The Russian detector was similar in action, except that the presence of the buried mine was revealed by the deflection of a needle across the dial of a galvanometer set in the handle of the pole.

So successful were these detectors that the Germans tried to render mines undetectable by encasing the explosive in a non-conductive material such as wood or plastic. The most efficient of these mines was the Schoe anti-

personnel mine. It was eventually defeated by using dogs trained to "point" at ground recently disturbed by the burying of mines. Over 3,000 mine-detecting dogs served with the British army.

Searching for mines with detectors and clearing them by hand was at best a slow process and exposed personnel to fire from covering troops. In 1942, the flail tank, first used at Alamein, was introduced. This was a Sherman tank having in front a roller driven from the engine.

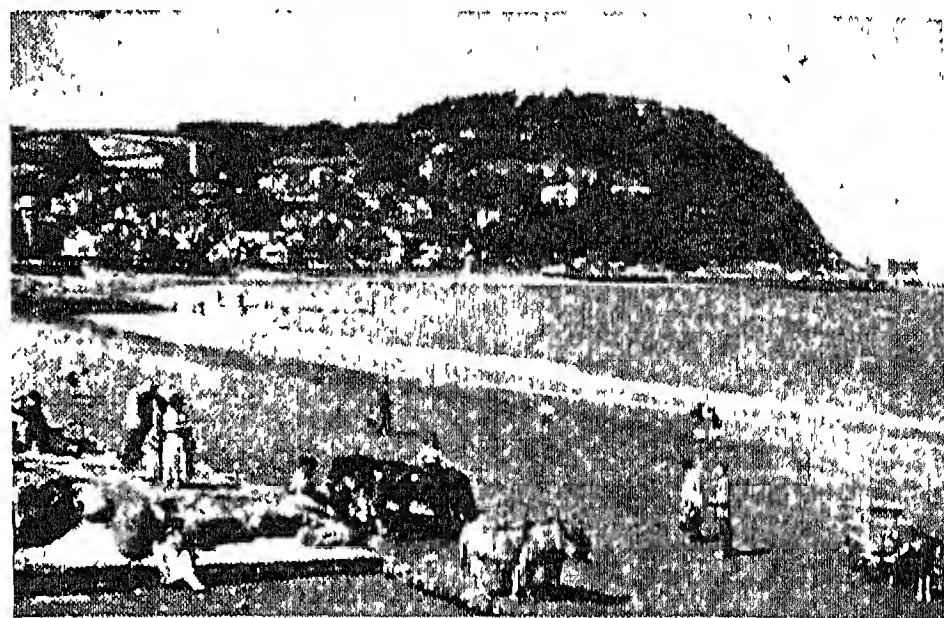
Attached to the roller were a number of lengths of chain which beat upon the ground and exploded the mines as the vehicle moved forward.

For the protection of certain permanent vulnerable points, such as railheads, the electro-pneumatic mine was introduced. The mine was buried beneath the ground and had attached to it a length of rubber tubing lightly covered with earth. Pressure on the tubing created a flow of air which depressed a diaphragm on top of the mine, so closing an electrical circuit which fired the charge.

Mines had little application to aerial warfare, and the so-called land mines dropped on the ground by aircraft were merely large time-bombs released by parachute. Efforts were made to develop aerial minefields consisting of containers of explosives suspended from balloons and released in the path of attacking bombers. Although fitted with time switches to explode them after the raiders had passed, they proved an erratic weapon and liable to drift with the wind on to the course of defending aircraft.

Minehead. Urban dist. and market town of Somerset. It stands on the S. side of the Bristol Channel, 25 m. N.W. of Taunton. S. Michael's church is a fine 14th-century building, with a beautiful rood loft and other features of interest. The older part of the town is built on the side of North Hill, a bold eminence which protects the lower and newer part. At Quay Town there are some old fishermen's cottages, the old harbour built in 1616, and the unique mariners' chapel. Minehead is a popular holiday resort, from which

Exmoor, Lynton, and other beauty spots in Somerset and Devon can easily be reached. It was a flourishing port in the Middle Ages, and for a short time was a corporate town. From 1558 to 1832 it sent



Minehead, Somerset. The Bay looking towards North Hill

two members to Parliament, and it had fairs and markets. Market day, third Mon. Pop. (1951) 7,401.

Minenwerfer (Ger., mine-thrower). German bomb-projector used in the First Great War, nick-named "Minnie" by British troops. The spherical bomb weighed 200 lb. and was fitted with a rod which fitted into the barrel of the projector, the missile being fired by a large ballistite cartridge. The minenwerfer was eventually replaced by the heavy mortar. See Mortar.

Mineo (anc. *Menaenum*). Town of Sicily, in the prov. of Catania. Situated on a hill, 21 m. by rly. S.W. of Catania, it was founded by the Sicel leader Ducetius in the middle of the 5th century B.C. Near Lacus Palicorum was the temple of the Palici, revered as the holiest place in Sicily.

Mineral Dressing. A term covering the operations by which mineral ores, mineralised liquors, coal, oil, etc., are treated to remove worthless or undesired fractions and brought up to an acceptable standard for further treatment, shipment to customers, or direct use. Usually these operations involve little or no alteration of the physical constitution of the valuable portion of the crude material, and are carried out close to the source, to minimise transport of gangue or tailings, as the barren part of the mined ore is termed. Besides removing gangue, mineral engineers may be asked to separate a number of high-grade products from a given ore-body or to remove an element which would interfere with smelting.

The mined ore is crushed to the point where its constituent minerals are adequately broken apart.

Then the liberated fragments or minute particles (according to the grain of the crystalline interlock comprising the ore-rock) are separated into (a) concentrates (the various desired minerals in their naturally occurring form but purified from associated minerals to a predetermined grade); (b) middlings (impure concentrates but worth further treatment); (c) tailings (valueless ore-rock which is discarded).

LIBERATION. All that is needed in grading industrial rock required e.g. for use as road metal, railroad ballast, foundry limestone, is to crush and screen it into grades or sizes, measurable by reference to two rings, one large enough to allow the screened material to pass through it (undersize or *minus*), one too small for it to pass through (oversize or *plus*). Grading gives place to screening when the width of the pieces to be graded is less than about 2 ins. Industrial powders are controlled down to sizes less than one micron (10^{-6} mm.). For many industrial purposes the size of the particle determines its reaction rate, or its physical behaviour in the paint, cement, plastic, pulverised coal, cosmetic, aggregate, catalyst, abrasive, etc., in which it is to be incorporated; and an important specialised technology is concerned with such measurement down to macro-molecular sizes only discernible with an electron microscope.

In liberation in the ore-dressing sense, rock may be delivered to the dressing plant (mill, concentrator) dry; slimy with barren clay-stuffs; inert or corrosive; clean-run or diluted with country-rock which should be removed before expensive crushing is begun; and at sizes varying from several feet (12 cu. ft. go to the ton in most ores) to dust fine enough to be dangerous to health. Primary and secondary crushing is typically done dry, using fixed-path machines which in from one to seven stages bring the material to the size of coarse gravel. At the same time, slime may be removed and the rock cleaned by washing, so that when the crushed ore is displayed on belt conveyors as it travels from machine to machine unwanted timber, "tramp iron," unexploded dynamite, country rock, etc., can be picked out. This hand-picking is an important stage in the "beneficiation" of raw coal.

During crushing many millions of tons of barren rock are discarded by heavy-media separation. This is a process using a high-density fluid formed by mixing

finely ground mineral matter (barytes, ferro-silicon, galena, mill scale are some of those used) with water in such a way as to maintain a stable pool at the desired density in a tank, floating rock being withdrawn from above and sinking rock from below. The fluid density determines the splitting point and is adjusted so as to discard all rocks too light (and therefore too low in their content of the desired mineral) to be worth treating. With coal, which is lighter than its attendant shale, the opposite gravitational considerations apply.

Fixed-path crushing machines have steel faces which alternately approach, and recede from, one another and which seize and smash the stream of rock falling between them. Primary crushers bring the ore down to c. 4-in. ring. The oldest, the Blake jaw crusher, has a fixed vertical face against which a swing jaw is pressed by eccentrically actuated toggles, giving nut-cracker action. In the gyratory primary crusher, a conical steel cone gyrates inside a heavy fixed ring of steel, crushing any rock nipped between the two faces as it rolls round its fixed circle. Secondary fixed-path crushers take the ore down to $\frac{1}{2}$ in. or $\frac{1}{4}$ in. by dry methods. Modified gyratory crushers, rolls (a horizontal mangle), hammer mills (swinging weights revolving in a cage together with flying rock) are typical. Somewhere about the $\frac{1}{4}$ in. size fixed-path dry crushing ceases to be economical. Finishing by wet-grinding in tumbling mills is therefore usual. These are horizontal cylinders charged with heavy rods, steel balls, or pebbles through which the pieces of ore pass and are repeatedly struck by the flying crushing bodies set in motion as the mill turns on its axis.

SIZING, SORTING. When the ore has been liberated at sizes down to fine shingle, if there is some difference between the densities of particles of concentrate and gangue, separation by gravity methods follows. Screens are used to "police" the crushing circuit so that as soon as a particle is small enough to pass through a screen of "liberating" mesh-opening it is removed to the concentrating section of the plant. The oversize is returned to an appropriate crusher for further comminution. Such devices lose efficiency rapidly below 20-mesh (dry) or 65-mesh (wet), at which points sorting by size is abandoned in favour of classification by settling rate through a fluid.

GRAVITY SEPARATION. Some minerals—notably cassiterite, the chief ore of tin—can be separated on a commercial scale only by gravity methods. Others occur coarse enough for density difference between the valuable portion and gangue of sized or sorted feeds to be exploited in suitable appliances. These minerals include diamond gravels, gold, silver, and native copper, platinum sands, tungsten, ilmenite, fluorspar, barytes, galena, blende, various iron ores, and coal. Jigging is applicable down to somewhere between 20 and 50-mesh; sluicing and treatment on shaking tables to about 200-mesh; "vanning" and "buddling" below that. In jigging, sized feed runs to a series of open boxes closed beneath by a retaining grid through which water can be violently pulsed and withdrawn. Equal-sorted sands are fed into horizontal streams of water. The small heavy particles burrow down while the bigger light ones are swept by the water over a discharge weir, helped by the jerky movements of the tables.

Most of the world's engineering metal is today concentrated by flotation (*q.v.*). The history of this method begins with Herodotus, who records that Amazonian maidens fished in ponds with goose-quills sticky with tar, which brought up specks of gold. The currently used process is based on the patents of Picard and Sulman, who in 1905 connected accurate control with the use of very small quantities of chemicals to produce a selective effect on the surfaces of the desired particles of ore, and on them alone. The steps in flotation are designed to develop a water-hating film on the desired mineral while leaving all the others wet. Once the ore-pulp has been brought to this state air is bubbled through it and the desired particles climb into the rising bubbles, and ride to the top of the flotation tanks or "cells," where they form a froth gleaming with its heavy load of concentrate. This concentrate is then skimmed off, and dried ready for shipping.

OTHER PROCESSES. The minute quantities of gold in its ores (perhaps only an ounce in several tons) are extracted by the Cyanide Process (*q.v.*). Other hydro-metallurgical techniques include the leaching of copper and the treatment of bauxite with hot caustic solvents to obtain aluminium. Sometimes ferro-magnetic properties are exploited to separate non-magnetic from magnetic particles

as they pass through a powerful field. At the Hermann Goering ironworks non-magnetic limonite was kilned in a reducing atmosphere to produce a surface of magnetic oxide, thus permitting a low-grade bog-iron ore to be brought up to metallurgical grade. Another process is the electrostatic separation of good from bad conducting particles in a high-voltage field. Radio-active minerals can be caused to signal their presence to Geiger-Muller detectors, which relay the message into electronic

controls and cause deflecting mechanisms to remove such pieces of ore from a passing stream.

Coal-cleaning uses jigging, sluicing (the Rheolaveur process), sink-float or heavy-media separation, and tabling for its upgrading from the contaminating material mined from narrow seams by mechanical devices which in the dark workings cannot be made to discriminate between true coal and dust-coated shales. Consult Handbook of Mineral Dressing, A. Taggart, 1946; and the Mining Magazine.

MINERALOGY: SCIENCE OF MINERALS

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A general article explaining how minerals are studied and classified. Fuller descriptions of particular aspects of the subject will be found under, e.g., Crystallography; Isomorphism; Metallography; Mohs Scale; and under the various minerals

The earth's crust and certain extra-terrestrial bodies known as meteorites are composed chiefly of different kinds of minerals, these being substances which individually have a definite or a restricted range of chemical composition and atomic structure, and, given favourable conditions, assume a characteristic crystalline form. The study, description, and classification of minerals constitute the science of mineralogy, which is, therefore, a branch of natural history, and incorporates the application of several other sciences—e.g. chemistry, physics, crystallography, geology and petrology, geography, and economic geology.

A mineral must be distinguished from a rock (*q.v.*) which is a mineral aggregate, such as coal, limestone, granite, slate. A pure natural oil and native quicksilver, however, are minerals as they possess a definite chemical composition and atomic structure. Exceptionally, the constituents of a mineral may occur in an uncrystalline or amorphous state (e.g. certain ochres), and the material is then classed as a mineral; on the other hand, natural glass, obsidian, is a rock because it contains the constituents of several mineral species, although these have not yet crystallised out.

Minerals have been of interest to man since the Stone and Bronze ages, but it was not until the end of the 18th century that the systematic study of minerals was put on a scientific basis, by Romé de l'Isle and R. J. Haüy. The precise study of crystalline form was made possible by Wollaston's invention, 1809, of the goniometer for measuring the angles between crystal faces, and many major inconsis-

tencies were cleared up by Mitscherlich's exposition of isomorphism in minerals, 1820. The vast amount of systematic descriptive mineralogy was classified by J. D. Dana and C. Hintze, whose texts remain standard works.

Mineralogy is not only a classificatory science, but has immense philosophical, social, and economic value. The occurrence and distribution of minerals containing useful metals have a fundamental bearing on ways of life and international relations; the presence of uranium-bearing minerals may be mentioned as a striking, though relatively minor, consideration in this connexion. Furthermore, the evidence of mineral occurrences and interpretations of their origin have had an important effect on the trend of theories concerning the natural history of the earth.

It is important to distinguish between those characteristics of a mineral species which are (a) essential and diagnostic, such as chemical composition and atomic structure, which determine the crystalline form, optical, electrical, and crystallo-physical (cleavage, etc.) properties, and specific gravity; and (b) those features which are not essential or necessarily consistent, such as colour, lustre, hardness, form and structure of aggregates, and occurrence.

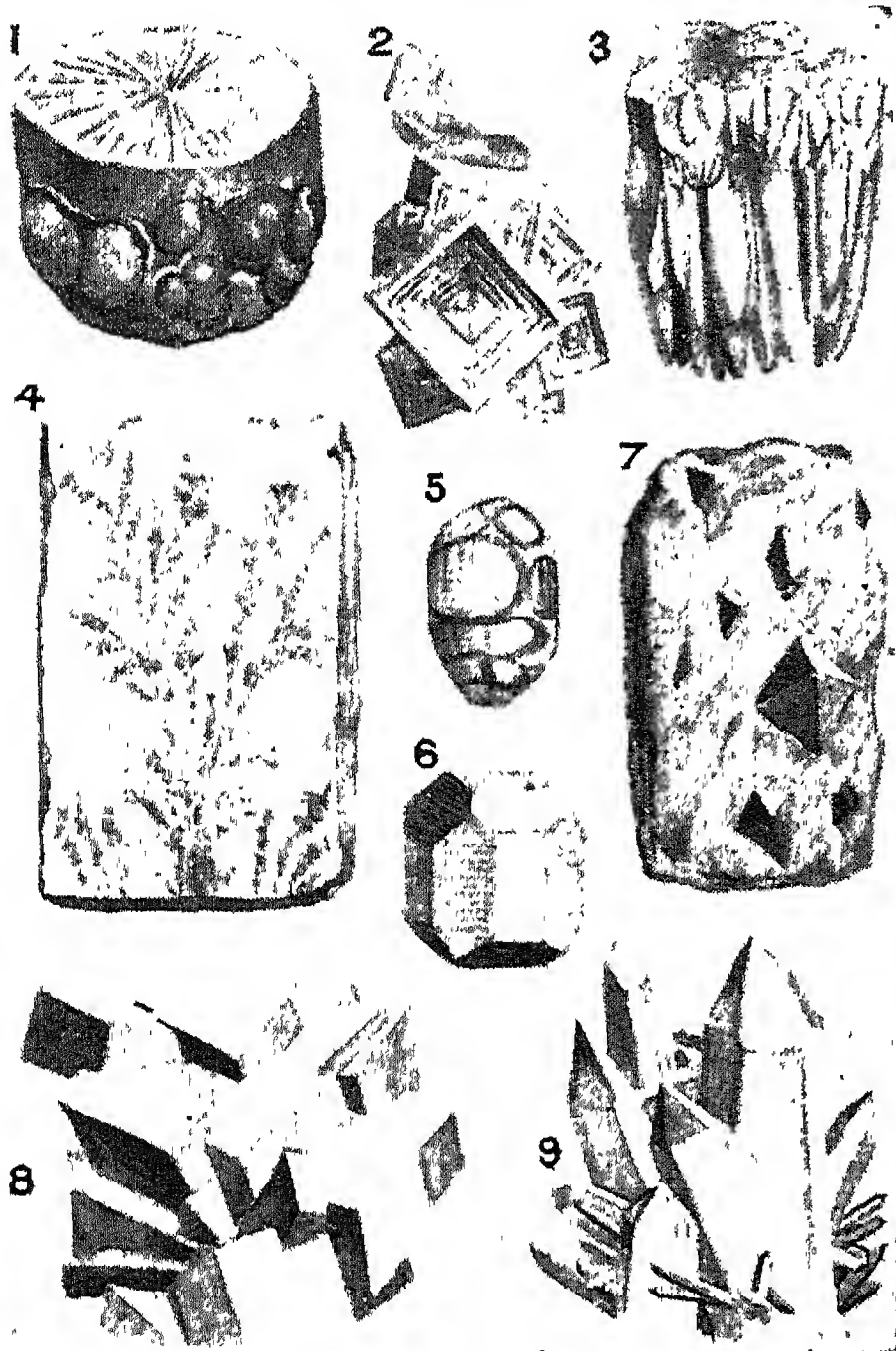
Although chemical composition is a fundamental characteristic of a mineral species, the atomic structure, or the way in which the constituent atoms are arranged, is of equal importance. A few native elements occur as minerals, e.g. native iron, gold, copper, silver, bismuth, arsenic, but many minerals are salts of various acids, and include sulphates, phosphates,

carbonates, and silicates. These range in complexity from simple salts such as sodium chloride (halite, NaCl) to the complex molecules of many silicates, such as orthoclase (potassium aluminium silicate, KAlSi_3O_8), the micas, chlorites, amphiboles, and tourmaline. Another very important group of minerals is the oxides, which include iron oxides (haematite, limonite), tin oxides (cassiterite), and silicon oxide (quartz). Many metallic ore-minerals are sulphides, for instance galena (lead sulphide), sphalerite (zinc sulphide); and many copper ore-minerals are complex sulphides and sulph-arsenides.

Minerals therefore fall into groups composed of native elements, oxides, sulphides, sulphosalts, oxygen salts such as the carbonates, silicates, chromates, salts of organic acids, and hydrocarbon compounds (natural oils).

An important chemical property of minerals is the phenomena of isomorphism and isomorphous substitution. Certain minerals have analogous chemical composition, e.g. the carbonates, calcite (CaCO_3), magnesite (MgCO_3), and siderite (FeCO_3); these minerals possess similar crystalline form, and may form intermediate compounds, e.g. dolomite ($\text{CaCO}_3 \cdot \text{MgCO}_3$). Such a group of minerals is called an isomorphous series. Far more common is isomorphous substitution, where minor amounts of an element partially replace an essential constituent by virtue of a similarity of atomic size; an example of this is the small cadmium content of many sphalerites (zinc sulphide).

Although a chemical analysis is desirable, many minerals, especially the ore-minerals, can be determined by qualitative blow-pipe tests. The necessary equipment can be carried in the field and the various reactions, such as heating on a charcoal block, with and without fluxes, are often diagnostic. Another useful technique is spectrographic examination. This method is very rapid for qualitative determination and has the advantage of indicating the major constituents and also elements which are present only as traces. Unfortunately, certain elements such as fluorine and sulphur do not give a positive reaction, and others often prove difficult. For large amounts of any particular constituent, quantitative spectrography is not so accurate as chemical analysis: spectrography, however, is the best analytical technique for trace elements.



Mineralogy. 1. Marcasite, showing internal radial structure. 2. Hopper-shaped crystals of salt. 3. Haematite, with nodular exterior and crystalline internal structure. 4. Dendritic pyrolusite. 5. Olivine crystal. 6. Pyrite. 7. Octahedral crystals of magnetite in schist. 8. Crystal of fluorspar. 9. Quartz crystals

From specimens in the Science Museum and in the Museum of Practical Geology

Much useful information has been gained by the synthesis of minerals in the laboratory and, in recent years, by investigating the behaviour of simple chemical systems under high temperature-pressure conditions.

The nature of the atoms constituting a mineral determines its chemical composition, but the way in which these atoms are grouped together (the atomic structure) is the fundamental physical property determining many diagnostic features, such as cleavage and crystal form. The atoms of a mineral are arranged on a definite geometrical pattern in space and are held rigidly together by bonds of force. Any particular mineral can be visualised as being made up of a series of identical bricks, each composed of a certain number of atoms arranged in a similar specific manner. This brick is the smallest unit of the whole pattern or atomic structure which, when repeated in three dimensions, builds up the crystal lattice, and it is known as the unit cell. The unit cells are simple geometrical forms such as cubes, face-centred cubes, hexagonal prisms. There will be a series

of planes through any crystal lattice which will cut similar atoms at regular intervals, thus accounting for certain planar properties of crystals such as the regular crystal faces and twin planes.

Many minerals when struck break along sets of parallel planes. This phenomenon is known as cleavage and is also intimately connected with the bonding forces in the crystal lattice. The specific gravity of a mineral is a function of the atomic weight of the constituent atoms, and the closeness of their packing in the lattice. The phenomenon of polymorphism is directly dependent on the lattice. For example, andalusite, sillimanite, and kyanite have identical chemical composition, but the very

different properties of these three minerals are the result of different atomic structure. Isomorphism occurs because certain minerals of analogous composition have similar atomic structures and therefore similar properties. Isomorphous replacement occurs when one element replaces another without undue distortion of the lattice on account of a similarity in atomic size of the elements involved.

A crystal lattice can diffract X-rays. With special apparatus it is possible to take a photograph of the diffracted rays which have impinged on a mineral. The plate is seen to consist of a characteristic grouping of lines or spots, and can often be used to determine the structure of the mineral. X-ray analysis is one of the most useful specialised techniques in determinative mineralogy.

The hardness of a mineral is often a diagnostic property and can be easily estimated by comparison with a set of standard minerals.

Optical Properties

The optical properties of transparent minerals is of first rate importance to the mineralogist, who, with the aid of a petrological

microscope, can determine such properties as refractive index, birefringence, and dispersion. These features are intimately related to the symmetry of the crystal lattice structure, and the property of a large group of minerals, of splitting up a ray of light into two refracted rays (double refraction). Minerals which possess this property are termed anisotropic; those which do not are isotropic. The anisotropic minerals are further subdivided according to the way the two refracted rays behave.

An important optical property of a mineral is its refractive indices: isotropic (cubic) minerals have only one value for the refractive index; uniaxial minerals have two (hexagonal and tetragonal symmetry), and biaxial minerals have three (orthorhombic, monoclinic, and triclinic symmetry). The refractive indices can be measured by comparison with liquids of known refractive index, using the immersion method or directly by other methods.

These optical properties are determined by microscopic examination of crushed grains or in thin section under ordinary or polarized light transmitted through the mineral. The mineral must, therefore, be non-opaque; but many minerals, especially ore-minerals, are opaque. These may be studied microscopically by using a metallographical microscope.

Mineral Occurrence

Minerals can be classified according to the type of rock in which they occur. The characteristic minerals of true igneous rocks are quartz, feldspar, feldspathoid, mica, olivine, pyroxene, amphibole and iron ores. The nature of the mineral assemblage determines the igneous rock-type, e.g. lime feldspar, pyroxene, and/or amphibole signifies a basic rock; the presence of quartz, soda, or potash feldspar with mica indicates an acid rock. The minerals characteristic of the late stages of consolidation include the ore-minerals found in veins, for instance tin-ores, with acid rocks. Rocks formed by accumulations of organic material give rise to limestones, siliceous deposits, phosphates, and coals. Metamorphic rocks, formed from pre-existing rocks, often include new minerals, e.g. andalusite, kyanite, staurolite, may be formed in metamorphosed slates; mica, chlorite, garnet, in schists and gneisses.

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Mineral Waters. Term applied to water containing saline ingredients and often carbon dioxide gas. It mostly refers to natural waters which are used in the treatment of disease, either internally or in the form of baths. Some waters, such as Apollinaris and Perrier, are only slightly impregnated with saline matter, and are on that account especially adapted for use as table waters. Comparatively free from iron, they can be mixed with whisky without discoloration. The term is also applied to aerated waters.

There are many well-known mineral waters containing sodium sulphate (Glauber's salt) and magnesium sulphate (Epsom salt) in sufficient quantity to make them useful saline aperients. This class of water has been successfully prepared artificially in Great Britain.

A number of natural mineral waters contain iron salts and are known as chalybeate. Examples are Flitwick, Beds; Harrogate; Llandrindod; Bussang (France); Spa (Belgium); Tunbridge Wells. Barium occurs in Llangammarch water; bromine and iodine in water at Woodhall, Lincs; lithium in Baden-Baden water. Other waters, *e.g.* at Bath, are radioactive and give off argon, helium, niton, krypton, and xenon gases. The water at Bath is an example of thermal mineral water, the temperature being 88°–120° F. Droitwich water contains about 2,712 grains of sodium chloride (common salt) per pint, and is used at a temperature of from 98° to 101° F. for muscular rheumatism and sciatica. Sulphur dioxide and benzoic acid may legally be added as preservatives. See Aerated Waters; Spa.

Minerva (Lat., from the same root as *mens*, mind). In classical mythology, the Italian goddess whom the Romans identified with

the Greek Athena. One of the chief Roman deities, she was worshipped in the temple on the Capitol. She was the goddess of wisdom and the patroness of all arts and crafts. After her identification with Athena she became the goddess of war, and spoils were often dedicated to her. A festival was held in her honour at Rome from March 19 to 23. See Athena.



Minerva. Antique statue in the Vatican Palace, Rome

Minervino-Murge. Walled town of Italy, in the prov. of Bari. It is 28 m. by rly. S.S.W. of Barletta, and produces fruit, vegetables, and olive oil. There are quarries near by.

Mines, ROYAL SCHOOL OF. London teaching institution, founded as the Government School of Mines and of Science applied to the Arts after the Great Exhibition of 1851. By 1863 the more general courses were omitted in favour of mining, metallurgy, and geology, and the name was changed. The original buildings were in Jermyn Street, but by

1880 all departments had been transferred to premises at S. Kensington now known as the Huxley Building. When the Imperial College of Science (*q.v.*) was established as a school of the university of London in 1907, the R.S.M. became one of the three supporting colleges. In 1913 its new building in Prince Consort Road was completed and occupied. The school grants associateships in mining metallurgy, mining geology, and oil technology; since 1925 the examinations for them have become also the final examinations for B.Sc. degrees at London in those subjects.

Minesweeper. Vessel designed or adapted for the removal of sea mines. In the First Great War, the Royal Navy successfully used trawlers for minesweeping, supplemented in due course by a small flotilla of obsolete torpedo gunboats, whose higher speed gave them some advantage over the trawlers. By the date of the armistice, Nov. 11, 1918, flotillas formed to deal with mines comprised 110 naval vessels, mostly built during the war; 52 hired

paddle steamers; 412 fishing trawlers; 142 drifters; and 10 shallow-draught craft of special design. In four and a half years of war 214 British minesweepers were lost. Other warships sunk by mines numbered 46, plus 225 auxiliaries.

Vessels used for minesweeping during the Second Great War included those of the British Algerine design, approaching 1,000 tons displacement, with a speed of 16.5 knots; the smaller Bangor type, laid down at the outbreak of war, under 700 tons with a speed of 16 knots; and the type built in the U.S.A. under Lease-Lend displacing nearly 900 tons with a speed of 17.5 knots. All these were rated as fleet minesweepers. For inshore work there were wooden motor minesweepers, British types of which numbered two, of 250 and 360 tons respectively; both had a maximum speed of 10 knots. They were especially useful in dealing with magnetic mines. Corresponding craft of U.S. design and construction displaced a trifle over 200 tons, with a speed of 13 knots. Typical trawlers of Admiralty design used for minesweeping were of 560 tons, with a speed of 12 knots. These vessels departed considerably from the hull form used in the fishing trawler, and were in effect a minor form of warship. In clearing the Thames estuary of magnetic mines, wooden motor launches specially equipped did excellent work.

Minette. In geology, name of an igneous rock of the lamprophyre group (*q.v.*). It is rich in biotite mica, orthoclase feldspar, and calcite. The term is also used in an entirely different sense for the iron ores of Jurassic age occurring in Lorraine, etc. See Iron.

Mineworkers, NATIONAL UNION OF. British trade union of coal mine workers. The first national miners' organization in the U.K. was the Miners' Association of Great Britain and Ireland, membership c. 100,000, which lasted 1841–48. In 1888 the Miners' Federation of Great Britain, membership 36,000, was established by miners' associations of Yorks, Lancs, and Cheshire, the Midlands, Fifeshire, and S. Wales. The National Union, representing Durham and Northumberland, came in only in 1908, making federation membership c. 600,000. With the admission of workers other than coal face workers, membership rose by 1920 to c. 900,000. The name Mineworkers' Federation of

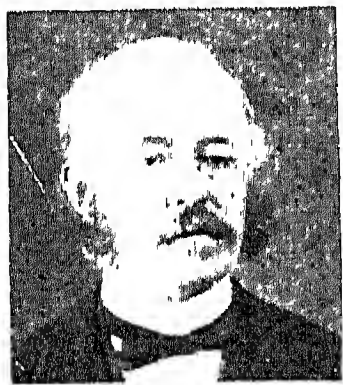
Great Britain was adopted in 1934, and from Jan. 1, 1945, the district unions affiliated to the federation amalgamated into one union, the National Union of Mineworkers.

Important events in the history of the federation were the strike of July–Nov., 1893, against a reduction of wages, which failed, but secured virtual recognition of a minimum wage; the strike of 1912 to secure a national minimum of 5s. a day for a man, and 2s. for a boy, which ended with an Act for setting up district minima; participation in the Sankey commission, 1919, which recommended nationalisation of the mines; the strike of 1921, the settlement of which did not provide the national wage demanded, but made wages a first charge on the industry; the dispute of May–Oct., 1926, which involved the General Strike (*q.v.*).

Nationalisation of the mines in 1947, though fulfilling the miners' wishes, disappointed them in that they had less say in management than they had hoped for. The local disputes that followed had, however, no backing from the union. *See* Coal; Mining; Sankey.

Minex. A general purpose coal-mining explosive. It contains as explosive ingredients 8 to 11 p.c. nitroglycerine and 61 to 64 p.c. ammonium nitrate. If sodium chloride (12.5 to 14.5 p.c.) is added it functions so as to lower the temperature of explosion and to increase safety in the presence of firedamp and coal dust.

Minghetti, MARCO (1818–86). Italian statesman. Born at Bologna, Sept. 8, 1818, he was edu-



Marco Minghetti,
Italian statesman

cated at the university there. In 1846 he started a newspaper, *Il Felsineo*, which brought him such reputation that in 1848 Pius IX made him minister of public

works. Espousing the cause of Italian unity, he joined the army of Charles Albert, distinguishing himself at the battle of Custoza, 1848. A friend of Cavour, he became secretary-general to the ministry of foreign affairs 1859, and from 1863 to 1864 was prime minister. Ambassador to London, 1868, and to Vienna, 1870–73, he was again prime minister from 1873 to 1876. Died at Rome, Dec. 10, 1886.

Minho OR MIÑO (anc. *Minius*). River of N.W. Spain and N. Portugal. Rising in the N. highlands of

the prov. of Lugo, it flows through it and S.W. through Orense. It then divides Pontevedra from Intre Doura Minho in Portugal, falling into the Atlantic Ocean, S. of Guardia and N. of Caminha, after a course of 173 m. The area of its drainage basin is est. at 157,000 sq. m. It is navigable by small vessels for 25 m., to Salvatierra in Galicia. Its estuary is wide, but is impeded by a sand bar. The Sil is its chief tributary.

Miniature. Although the word miniature has come to connote size, *i.e.* portraits small enough to be held in the hand, it was derived from *minium*, the Latin word for the red lead used in illuminated MSS. for the delineation of illustrations in small size. These were doubtless at times cut out and framed separately.

Probably the French miniatures attributed to Clouet were actually cut out from MSS. Certainly at first miniatures were painted on vellum, parchment, or chicken skin, stretched upon cardboard, usually on a portion of a playing card. Thence the idea was adopted of painting actually upon cardboard and, in the 17th century, on ivory. Miniatures have also been painted on copper or silver, slate, lapis lazuli, and marble.

The greatest exponents of the art have been Englishmen, but it received ready acceptance on the Continent, and some of the best painters in the 18th century were Frenchmen or Swedes. Some of the finest miniatures were executed by Holbein (1497–1543). Following him came Nicholas Hilliard (1537–1619) and his followers and the two Olivers, Isaac (d. 1617) and Peter (d. 1647). Their works are marked by extreme attention to detail, simple technique, a striking absence of shadows, the presence, as a rule, of a bright blue background, and a masterly skill in representing costume and coiffure. Colour schemes improved as time went on, Peter Oliver using in many instances a rose-coloured curtain, or some such drapery. The Olivers were followed by Hoskins (d. 1665), a man of greater ability, who, not entirely neglecting the blue background, introduced glowing colour schemes, and painted miniatures greater in importance than his predecessors had done.

He was succeeded by Samuel Cooper (1609–72), who excelled all who had gone before, and whose work in dignity, breadth, and ability has never been equalled. The constantly repeated Walpole phrase to the effect that

a miniature by Cooper is like a life-sized Van Dyck seen through the wrong end of a telescope is by no means lacking in truth. Cooper's small portraits are perfect reproductions of character, painted with marvellous truth, keen insight, and striking ability. They are life-like representations, subtle delineations of complex character. His brother Alexander (d. 1660), who worked in Sweden, Denmark, and Holland, was not so great. Lawrence Crosse (d. 1724) was a marvellous painter of lace, and an interesting group of men, who should receive attention, were members of the Lens family (18th century), half a dozen of whom were able miniature painters.

Working on Ivory

The second great period of English miniature painting is that of the 18th century. The introduction of ivory had given fresh possibilities to the art, and revealed the chance of brilliant execution, luminous quality, and all the charm that the new material, coupled with facility of brushwork, could originate. At the head of the school stands Richard Cosway (1740–1821), a man who had no equal although many imitators, an exquisite colourist, possessed of just the right ability to flatter, coupled with the skill of representing in a few easy strokes the superficialities of the faces he had to represent.

More serious in his intention, and also more solid in his execution, was George Engleheart (1752–1829), a man of prodigious industry and extraordinary accomplishment. Of quite another sort was John Smart (1741–1811), a profound student of the human face, a draughtsman of exquisite ability and rigid perfection, but a lover of quieter and more Quakerlike colour schemes.

At another angle stand the two Plimers, notably Andrew (1763–1837), remarkable for their brilliant portraits, somewhat monotonous, and often meretricious, but vivid, palpitating, attractive. Those of lesser importance were Meyer (1735–89), Ozias Humphry (1742–1810), Shelley (d. 1808), Edridge (1769–1821), Wood (1768–1809), Scouler (d. 1810), and Grimaldi (1751–1830); and around them were the numerous miniature painters of the 18th century, whose work crowded the Royal Academy of the day. Among these were many such as Hill (*c.* 1770–91), Bogle (*c.* 1769–1803), Vaslet (*fl.* 1775), who at times could paint a minia-

ture with extraordinary skill. But these occasional portraits were like meteors flashing across the artistic sky, and their usual productions were on a far lower level. The 19th century saw the decline of miniature painting, although the works of Newton (1785-1869), Ross (1794-1860), and Thorburn (d. 1885) are worth attention. The best-known miniature painters of the 20th century include Marjorie Forbes, Bertha Fowle, May B. Lee, S. A. Lindsey, Ephraim Strellett, Norah H. Taylor, and Alyn Williams.

In France miniature painting has had great exponents; one of the greatest who practised in France was Hall (1739-93), a Swede. Miniature art in France was at its best when Isabey (1767-1855) and Augustin (1759-1832) were working. In enamel no one has ever equalled Petitot (1607-91), though Prieur (d. 1677) comes very close to him.

Miniature Pinscher OR MIN-PIN. Toy dog with a history of over 200 years in Europe. It is not related to the Dobermann Pinscher (*q.v.*). It is sturdy and elegant with great self-possession and spirit. The head is narrow with a flat skull and strong muzzle. The small ears are set on



Miniature Pinscher puppies

high, and may be erect or dropped. The neck is arched, the chest well developed, and the body square with deep ribs. The tail is carried high and is docked short. The coat is short, straight, smooth, and hard. Colour may be black; blue; chocolate with tan markings in specified areas: black pencilling on the toes should be seen with all these; and solid red. Height should be 10-12 ins. at the withers. Smaller rather than larger dogs are preferred. There is no standard weight.

Minicoy. One of the Laccadive Islands (*q.v.*), in the Indian Ocean. It is an isolated coral atoll about 150 m. S. of the main group of islands. It belongs to India. Area 1½ sq. m. Pop. (1951) 3,447.

Minim. Smallest practical unit of liquid measurement in apothecaries' or wine measure. It is equal

to one drop. There are 60 minims to one fluid drachm, 480 to a fluid ounce, and 9,600 to one pint. The minim is denoted by the symbol m.

Minim. Musical note consisting of an open oval head with a stem, ϕ . Its time-value is one half of a semibreve (∞) or two crochets (\sharp).

Minimum Wage. Term used to denote the sum below which the wage paid to an employee should not fall. Such a minimum wage may be the idea of a social investigator and writer; a condition of an agreement between a trade union and a body of employers; or an amount laid down by a wage-fixing committee established by statute, and thus legally enforceable: it is then termed the statutory minimum wage.

The idea of the minimum wage developed during the second half of the 19th century, partly through the growth of trade unionism and partly through the growth of the public conscience. So long ago as 1891 the British parliament passed a "fair wages" resolution, requiring government departments to see that fair wages were paid for all work done under government contracts. A much stronger resolution was passed in 1909, and a fair wages committee was appointed to devise means to carry it out. The principle of the fair wages resolution, at first applied only to government contracts, was later widely incorporated in industrial legislation.

Australia passed an act in 1906, effective in 1907, enforcing a minimum wage.

The Trade Boards Act, 1909, for the first time in the U.K. specified a minimum wage (in tailoring, box-making, lace-finishing, and chain-making); the principle was extended to other industries in 1913; and in 1918 an act empowered the minister of Labour (an office created in 1916) to constitute trade boards in any industry where "no adequate machinery exists for the effective regulation of wages throughout the trade." The I.L.O. in 1928 adopted a convention recommending throughout the world the creation of minimum wage-fixing machinery in underpaid trades.

In the U.K. agreements between employers' associations and trade unions normally provide for minimum rates of wages on a time basis even where piece rates are usually paid, and sometimes provide also for a guaranteed minimum weekly wage. See Sweated Labour; Trade Boards.

Mining. Process of extracting minerals from the earth. Improved technique in geological exploration, including the use of electrical, magnetic, and mechanical methods to probe deep into the solid rock, have eliminated much guesswork from mine prospecting. Mining is always concerned with a wasting asset, and the better it is carried through in a given place the more worthless in a particular material will be the area exploited when mining ceases there. Most minefields in Great Britain have been known from ancient times, and the history of some still actively at work goes back into pre-Christian times.

It has been suggested that the Napoleonic soldier had some 50 lb. of metal behind his fighting effort, the fighter of the First Great War a few tons, and the fighter in the Second more than 50 tons. Similar increase in demand has grown in civilian life. To meet it, engineers have learned how to control tremendous rock pressures, so that some mines work to a depth of two miles, or reach far under the sea. Water, which usually defeated earlier miners at fairly shallow depth, is either sealed back or handled by giant pumping systems. Electricity, compressed air, gelignite, and the internal combustion engine, combined with the precise skill of delicately applied chemical engineering processes, are used to break huge tonnages of rock and strip them of their useful metals.

The products of mining include engineering and precious metals, industrial and precious gems, fluorspar, barytes, sulphur, cement rock; the raw materials of some plastics, dyes, and pharmaceuticals; petroleum and brine from deep bores; and even magnesium from sea-water. Ancillary mining processes may be important: a firm in western Canada, threatened with litigation over its sulphurous smelter fume, took to importing phosphate ore and, by chemical treatment involving the conversion of its smelter gas to sulphuric acid, produced a phosphate manure urgently needed by the agricultural community.

In the politico-economic field the mining and subsequent movement of precious metals and gemstones, notably gold, is a vital factor in international trade. In industry coal and, more recently, petroleum are of outstanding significance.

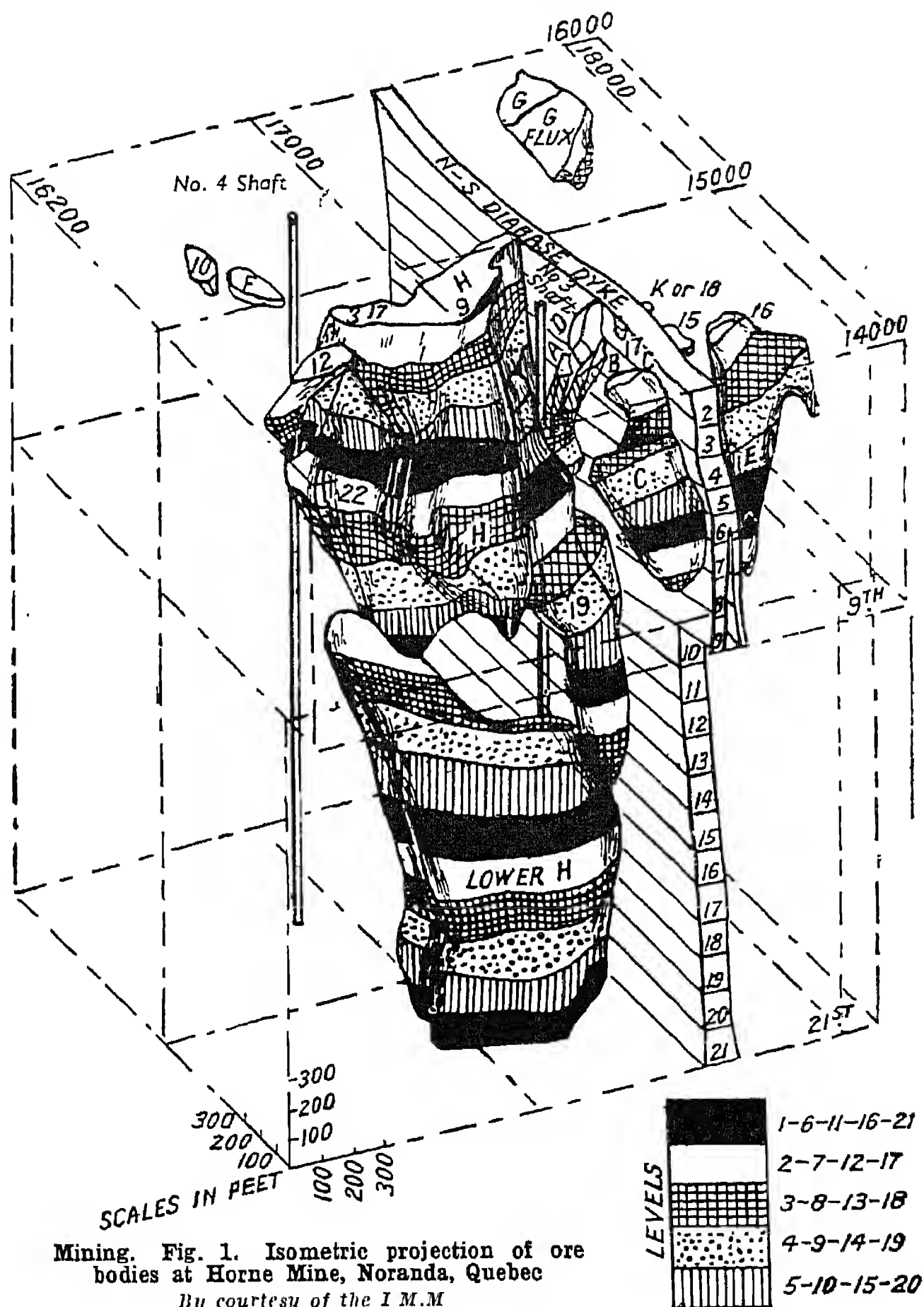
The location, development, and exploitation of an ore deposit is

carried through in a series of well-defined stages. Economically exploitable minerals are limited, broadly speaking, to well-defined geological zones. One of the best methods of obtaining an accurate picture of the general geology of a region is by air photographic survey, which is comparatively swift and cheap, and yields invaluable topographic information and indication of geological bedding, faulting, and folding, by the skilled use of which it is possible to decide on the most likely places for examination on the ground. Magnetometric records of the variation in concentration of Maxwellian lines of force, which alter in response to the stratification and mineralisation of the upper layers of the earth's crust, can also be made from the air. Such surveys have been made by low-flying helicopter off the coast of the U.S.A. to locate potential oilfields under the sea. In addition to intensive search for mineralised outcrops by direct observation and the use of pick and pan, scientific geophysical techniques are used to chart deeply buried rock formations. In one such method a rectangular grid is roughly surveyed over a chosen area, and a special kind of radio set is carried over the grid, where it measures at a series of stations the reception of a signal from a small high-frequency dynamo at an external point. The distortions of the signal thus recorded indicate corresponding changes in the rock strata, and build up a three-dimensional picture extending in suitable cases some hundreds of feet in depth. In another method a small explosive charge is fired and the time taken for the seismic disturbance to travel to a number of selected points yields information with regard to the rocks which have transmitted its waves. In yet a third method a delicate torsion balance is used to weigh the earth's crust from point to point. Thus the existence of a large deposit of, say, ironstone, among lighter country rock is detected by its distorting effect on the local gravitational field.

Observation, combined with the use of any geophysical method suited to the terrain, having been used to its effective limit, physical entry to the deposit for the purpose of securing ore-samples becomes necessary. This may be achieved by sinking prospecting shafts which follow the ore, or by probing with diamond drills. In oil-well work, drilling has been pushed to depths

exceeding two miles. It is feasible to reach to considerable distances at any slope with the smaller tool used for hard-rock prospecting, but as the hole costs money to make and can rarely be utilised afterwards, long-range work is kept to a minimum, and when done is as

body consisted of large and rotund masses of mineralised rock. The shape of the ore-body was accurately mapped before mining started, and a system devised suited to the job, and justified by the value in the ore which the drilling had proved to exist.



Mining. Fig. 1. Isometric projection of ore bodies at Horne Mine, Noranda, Quebec
By courtesy of the I.M.M.

far as possible vertical. An alloy-steel tube armed with diamond on its cutting edge is pressed into the rock, and rotated so as to cut a cylinder of the material through which it travels. These "cores" show the geological nature, direction, and mineralisation of the strata, and the drill-holes are accurately surveyed by the use of small cameras which take photographs of a plummet and a compass at a given depth and thus allow the operator to correct any drift of his drill-hole. An example of the use of drilling was in the development of the Noranda mine (Fig. 1) in Quebec. Here the ore

More usually a lode or (Australian) reef is to be mined. This is characteristically a fairly narrow stratum of valuable ore traversing, vertically or steeply, enclosing walls of country rock, usually barren or too poor in value to be worth mining. Where the lode is of plutonic origin, or has resulted from deposition in a fissure of molten rock or by natural transporting agencies such as superheated underground gases or liquids, the outcrop may reach the surface and there betray its presence to the searching prospector. Characteristically the uppermost zone will be leached by the

penetration of rain and flood-water so that its minerals may be either altered or washed down and redeposited in the zone of secondary enrichment below, in which the mineralogical character of the values is frequently complex. Below the secondary zone comes the true original lodestuff, unimproved by any mineral transported from the surface. This continues till the mine "bottoms out" or "faults out" through cosmic movements which have cut off the mineralising streams from the original fissure or weakness-plane.

Of a different type are the *banket* (Du., a kind of pastry with almond paste enclosed in it) reefs of the Witwatersrand. These were originally bedded deposits, laid down in conformity with the alluvial stratification of remote geological times, though the manner in which their gold was introduced remains conjectural. In these reefs large quartz pebbles are embedded in a quartzite matrix in the manner of the almond paste in *banket*—hence their name. Such deposits are far more predictable in their behaviour and, though subject to strata-displacements by faulting, show less local variation of value than a lode.

Types of Shaft

When sufficient work has been done, either by drilling or entry through shafts and adits (horizontal tunnels above the drainage level), to justify a costly scheme of development, entry for miners, timber, and machines must be provided and travelling ways to enable them to reach the working faces, or stopes. These ways, in the case of a steep lode, are usually shafts; they may be vertical, so as to cross the lode at a pre-determined depth, or incline, when they are usually sunk parallel to the slope of the lode and a short distance beneath it, on its foot wall side. At least two shafts are necessary as not only must there be secondary access in case of need (fire could destroy a shaft), but one of the shafts is required as the downcast, providing fresh air to the working places, while the other, the upcast, draws the foul and dust-laden air out, with the assistance of mine fans. The two shafts are inter-connected by planned ventilation "districts."

Mining engineers make considered arrangements for the control of the mine air at all stages. As the mine deepens, the temperature rises so that in the deepest mines, such as those of Wit-

watersrand, working conditions would be intolerable were care not taken. Dry and refrigerated air is pumped down in seriously hot mines, while the expansion of compressed air from the working tools and the evaporation of water from sprays, used to wet down dangerous dust, also help to cool the atmosphere. As it is important to avoid saturation of this hot air with water-vapour, psychrometric surveys are systematically made and a definite minimum approach of wet-bulb to dry-bulb thermometer readings maintained by the ventilation engineers. The amount of ore-dust floating in the air is measured by sampling and kept below a figure dangerous to the miners' lungs by dilution with fresh air and the use of electrostatic precipitators.

Cross-cuts and Levels

The development roads are called cross-cuts when they take the shortest horizontal path from the country rock to the lode, levels when they run along, or parallel to, the lode. Such tunnels slope slightly downwards to allow mine water to drain toward the gathering points from which the multi-stage centrifugal mine pumps lift it to the surface. This same slope downward aids the loaded trams or trucks (of ore) or tubs (of coal) on their way to the underground loading stations. In driving the tunnels compressed-air percussive drills, working at about 80-lb. per sq. in., are used. In a tunnel or "drift" they are heavy tools, mounted on stretcher bars. A "round" of holes is drilled during each working shift, to a pattern which has been evolved after testing. It is so arranged that when the resulting holes are charged with blasting gelignite and fired in the proper sequence, a "cut" is first blasted out centrally, followed by "easers" and "trimmers," the last of which carry forward the drift at its proper cross section and perhaps drop the severed rock into an easy position for gathering. After a delay during which water is finely sprayed on to the blasted rock to wet down dust, and the foul air is withdrawn by ducted fans, the "muckers" clear the broken rock into trucks and remove it. This work is often mechanised by the use of a compact power-shovel mounted on a truck which gathers the rock in front of it and loads it into empty trucks behind, compressed air providing motive power.

A series of these development drives is made at intervals down

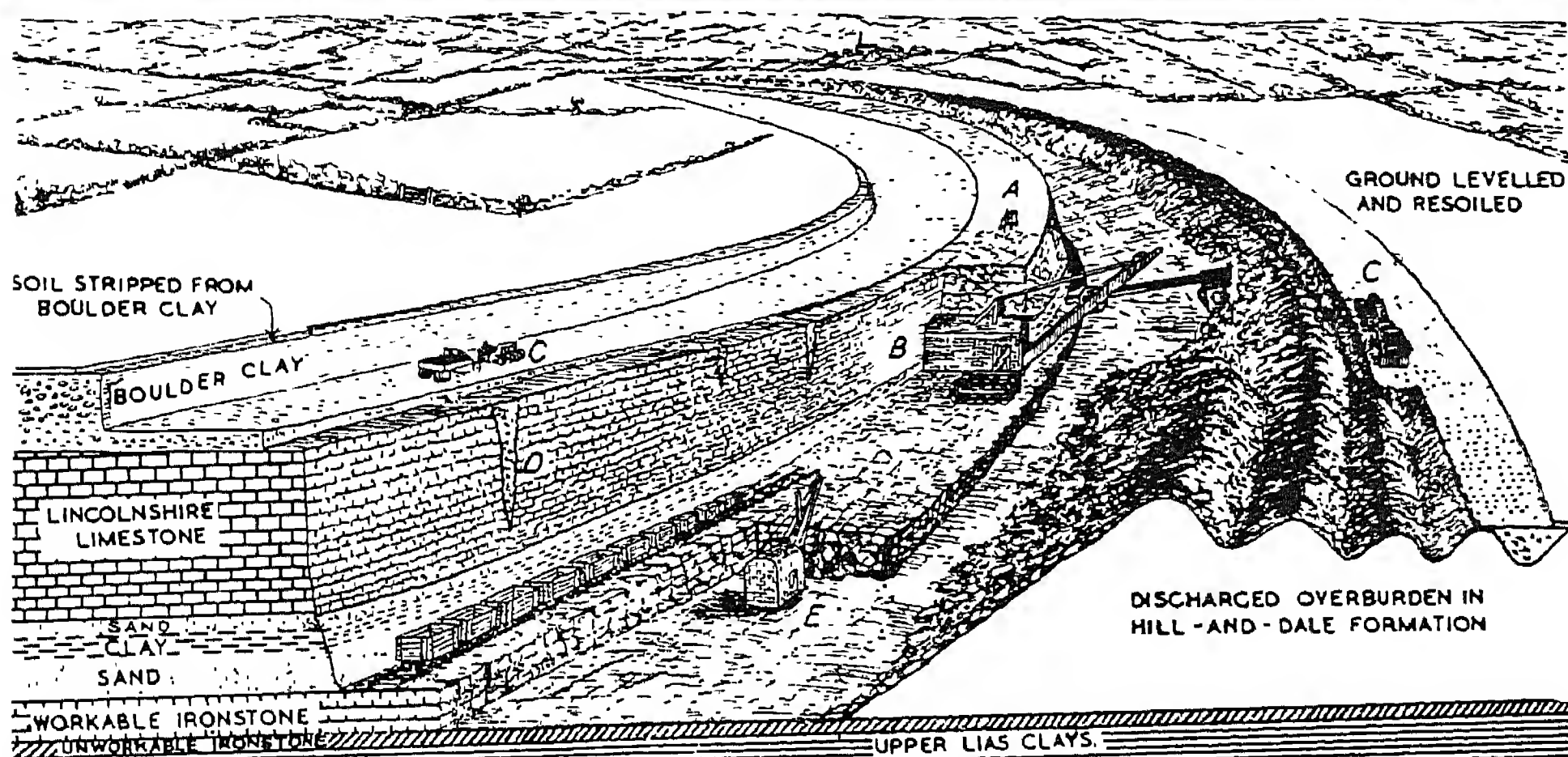
the lode (say 100 ft. apart). The ore thus opened above and below is next blocked out by "raises" or "winzes"—small internal shafts at regular intervals which cut the valuable ore body into 100 ft. squares. Samples are now cut by chipping an even groove across the exposed sides of the lode at regular intervals of, say, 5 ft., and the results are marked on an assay plan. This allows the consulting engineers to classify the blocks of ore into proved, probable, or non-profitable ore, and to plan accordingly. In Great Britain and elsewhere, public interests are protected by bodies such as the Inst. of Mining and Metallurgy which lay down conditions that must be satisfied before they certify the known ore reserves of a given property.

By this time the final pattern of exploitation is taking shape. Roads and rlys. are being built, surface works including houses and an ore-treatment plant are going up, the general unwritten rule being that only unavoidable development expenditure shall be made until several years of proved ore reserves have been completely blocked out.

Examination of Ores

A certain amount of ore has been shipped to mineral dressing laboratories for thorough testing and the working out of an extraction process. This is needed because the percentage of valuable mineral in ore as mined is usually small—perhaps one to two p.c. in a copper ore, or as little as two parts in a million in a gold ore. Some of the elements used in nuclear physics have no recognized minimum percentage to justify extraction. In the laboratory the extraction metallurgist uses X-rays, spectrography, microscopy, and a variety of physical and chemical tests to identify the minerals comprising the ore-complex, and to work out a suitable means of concentrating them. This is perhaps followed by a "pilot-plant" test in which some tons of mine ore are subjected to the proposed treatment, partly to ensure that no complications have been overlooked and partly to ascertain process costs and to train personnel. The plant in its final form will include equipment for mineral dressing.

Development is succeeded by exploitation. The manner in which the rock is removed, and the method of supporting the working place thus opened, depend on the shape and extent of the ore body. The problem set is one of structural engineering. As ore is taken,



A. Drilling blast-holes for shattering limestone in advance of the power shovel. B. Stripping overburden. C. Tractor-drawn scraper removing boulder clay overburden in excess of the capacity of the power shovel, and depositing it in the

dales, thus levelling the hill-and-dale formed by the power shovel. D. Cavities in the Lincolnshire limestone filled with boulder clay. E. Rock-navvy loading into wagons running on tracks laid along the top of the bared ironstone

Mining. Fig. 2. Diagram illustrating the development of an opencast mine

Drawn by Dr. W. David Evans by courtesy of the I.M.M.

the unsupported ceiling transfers its weight to the untouched surrounding walls which must now take the weight of an arched dome of valueless country rock. At great depths and with large stopes pressure may also cause the floor to heave, or rise, and if the pressure is not relieved the rock sustaining it bursts, perhaps with tragic and certainly with economically undesirable results. Where preliminary work has shown the shape of the ore body, a suitable extraction scheme obviates such an occurrence.

In "top slicing," layer after layer of ore is dropped downward through the main ore body while the roof of the work is allowed to cave down on to a timber mat as ore is withdrawn from below. In "shrinkage" stoping, block after block is severed and only enough ore is removed to equate the natural expansion due to breakage-voids, so that the severed ore provides its own support until the workers are safely away, after which it is run out from below. This method can be used only with steep lodes between firm walls. Various methods of achieving the same effect—temporary safety followed by reasonably clean extraction—are described in mining textbooks as overhand, underhand, breast, and rill stoping. In another technique massive deposits are tackled from below and work is progressively carried up, the space thus created being perhaps filled with waste from the surface.

An intermediate type of operation is "glory-hole" mining in which the workings are open to the sky, but the severed rock is funnelled down to a receiving shaft underground and then withdrawn by level to a shaft in the untouched country rock beyond the disturbed working zone. The diamond "blue ground" mine at Kimberley started in this way; but as the diggings deepened the problem of maintaining a safe slope on the side walls became insuperable, and work then went underground.

Opencast mining accounts for most of the tin production from alluvial workings in Malaya and Nigeria. Where the size of the deposit warrants large-scale operation, bucket dredges are used. These consist of a continuous chain of buckets supported in a framework on a double pontoon which can be manoeuvred in its "paddock," or pond of water, by means of winches working head ropes and side ropes in conjunction with anchorages on land. The dredge excavates a series of swinging arcs or straight cuts forward, lifting the overburden and running it astern so as to carry its pond forward with it. When the pay-gravel is reached, it is washed into jigs or over sluices which trap the cassiterite and reject the gravel. Smaller deposits are worked by means of gravel-pumps, ground sluices, or, where conditions permit, with draglines or power shovels. A substantial percentage of the world's tin has been won

by individuals using only a pick, a shovel, and a calabash or pan.

Some of the largest mines in the world are working huge low-grade deposits of copper disseminated through porphyritic gangue. At Morenci, New Mexico, 53,000 tons of low-grade copper ore are blasted daily; more than 100,000 tons of rock are treated daily at Bingham, Utah.

A typical opencast mine is developed as a series of benches (Fig. 2), the uppermost ones working into the overburden and removing it, while succeeding benches handle pay-ore. The bench is drilled at intervals, and periodically blasted. Power shovels then load the severed rock into ore-trucks, either on rails or motor-powered, and take it to the crushing and concentrating plant.

COAL MINING. By 1800 the importance of coal to iron was fully realized in Great Britain, and the annual output of British coal, chiefly from Tyneside, had risen to 10,000,000 tons, all shallow-mined coal, the problem of dealing with underground water still proving difficult although Newcomen's first steam engine had gone into action in Staffs in 1712. Gunpowder was applied to shaft-sinking in 1770 and, following Pickard's invention of crank motion in 1780, Watt's double-acting engine (1782) and his rotary engine (1784) came into being. These gave improved efficiency and allowed shaft-winding to be mechanised, thus greatly facilitating the raising of the coal to the surface. In 1789 serfdom

was abolished in the Scottish mines. Coal gas was adapted to commercial lighting in 1798. In 1815, Davy invented the safety lamp, which substantially reduced accidents in "gassy" mines.

The 1830s saw the beginning of mining trade unions. The mechanical fan was invented and used to reduce explosions from firedamp, and cage winding was introduced. Wire rope came in in 1841, underground compressed air in 1850, and the first mines inspectors were appointed in 1850 under a new Act. The coal cutting machine was invented in 1866 and electric power was taken down the mine in 1882. Mechanisation of work in mines, indeed, owes much to British pioneer work, and comparison between the British 71 p.c. mechanisation in 1938 and that of the U.S.A. with its much higher output per man-shift ignores the fact that in Great Britain a hundred years of exploitation have exhausted the thicker seams, so that by the 1940s most British coal came from beds which Americans would hesitate to develop. In the legislative field, British landmarks were the Truck Act of 1896, the raising of the age limit to 13 in 1900 for underground employment, and the Eight Hours Act of 1908. The Coal Nationalisation Act of 1946 led to the vesting of the British industry under the national coal board on Jan. 1, 1947.

Working a Coal Deposit

Coal deposits are usually fairly flat, and to work them two main underground attacks are used. In one, "pillar and bord" or "room and pillar," the seam is blocked out by drives into rectangles. The coal from the drives is raised and the pillars sustain the working roof. They are then "robbed" to a safe limit, the increasing weight of rock above helping in their severance. With this method the cost of timber support is low, but coal may be left behind. A more usual method is "longwall" mining. "Retreating longwall" is used when drives from the shaft go to the farthest boundary to be worked, and the coal is then extracted along a continuous long wall close to which the miners are protected by pit-props which can be "robbed out" as the working face advances, leaving the roof to settle on to any waste filling packed back into it. "Advancing longwall" works outward from a pillar of untouched coal which is always left round the shaft to protect it from subsidence, which

might upset the smooth running of the shaft gear or endanger life. The coal is cut and loaded mechanically wherever width of seam allows and is transported either by continuous conveyor systems, rope haulage pulling the tubs, actuated by pit ponies (in obsolescent cases), or by electric, compressed-air, or Diesel locos. At the shaft coal is raised in tubs or dumped into "skips," i.e. boxes holding some tons of material and so arranged that at the pithead they automatically turn upside down and discharge their load down to surface hoppers.

Open-cast coalmines were re-developed in the U.K. during the Second Great War. The extent of the coal deposit is estimated by means of drills, and calorific value of the coal is found by sampling a few shallow pits. Access roads are put in and the agricultural top soil is stripped off and stacked. The overburden is removed by scrapers and bulldozers, perhaps aided by power shovels and draglines. The exposed coal seam is then picked up by excavating machines, loaded into lorries, and dispatched. When the seam has been exhausted the site is restored, its drainage is relaid, and the topsoil is reinstated. In the U.S.A. huge stripping shovels, unsuited to conditions in Britain, handle open-cast coal very cheaply. Open-cast coal is more liable to spontaneous combustion than the denser and less porous fuel from deep mines, and precautions must be taken in its storage.

Intermediate between underground collieries and open-cast coal mines are the drift mines which exploit shallow seams. Access to these is usually gained by a short incline, up and down which "rakes" of tubs are drawn.

Coal is no longer mined only by hand. Cutting machines, mechanical loaders, etc., do not discriminate between it and the shales and clays from floor, roof, and parting seams. Coal is fairly light (density 1.3 to 1.5) while the associated impurities including massive pyrite are heavier. With coal coarser than "slack" sizes—say down to between $\frac{1}{2}$ " and $\frac{1}{4}$ "—it is easy to use this difference in weight to separate the light from the heavy matter in jigs or special sluices, or in heavy-liquid suspensions. Below such sizes the problem of draining away the water used in such separating processes becomes increasingly difficult. Fine sizes retain over 20 p.c. of their weight of moisture even after centrifugal

drying, and this would add to transport cost and difficulty in use.

Underground gasification of coal is a method of mining applicable in certain circumstances to thin or poor quality seams not worth recovery by normal practice. It was first suggested by Siemens in 1868; the first British patent was taken out in 1909. Russia, the U.K., the U.S.A., France, Italy, and Belgium have experimented with it. The coal is ignited and burnt underground by blowing air, saturated with steam, through or over it. The heat generated partly distils the coal downstream of the ignition zone, and the steam reacts with incandescent coke to produce hydrogen and carbon monoxide. The hot products are brought to the surface where the sensible heat of the gases, together with the heat of combustion of the inflammable constituents, is used to generate power. The amount of useful energy recovered depends on the porosity and heat conductivity of the surrounding terrain, and calorific value of the gases recovered varies from 20 to 100 B. Th. U. per cu. ft. (compared with 450-500 B. Th. U. per cu. ft. normally supplied for town's gas in England).

Mining and Metallurgy, Institution of. British institution founded 1892, and incorporated by royal charter in 1915. It devotes attention to economic geology, and the science and practice of mining, metallurgy, and mineral dressing. General meetings are held monthly from Oct. to May to discuss technical papers previously published in the monthly Bulletin. Transactions are issued yearly, I.M.M. Abstracts bi-monthly, and volumes of symposia proceedings from time to time. The offices are at 44, Portland Place, London, W.1.

Minister (Lat., servant). Title used in the U.K. for: (1) Members of the government who are in theory the sovereign's servants, the head of the government being the prime, or first, minister. A minister without portfolio is a designation given to a member of the government who has no departmental duties. During both Great Wars such ministers were appointed to assist the prime minister; ministers without portfolio have also been appointed to do special duties at other times. A similar term is minister of state, used also to designate a member of the government carrying out special duties: e.g. a minister of state was appointed in 1945 to assist the secretary of state for Foreign Affairs who was expected to be out

of London at various important conferences after the end of the war. The term minister is also used for representatives of their country in foreign capitals where the status of ambassador has not been accorded, *e.g.* the British minister at Sofia. (2) Men ordained for service in the churches of the Nonconformist bodies are known usually as ministers, or ministers of religion. The Church of England prefers the form clergyman. *See* Clergy; Prime Minister.

Ministry (Lat. *minister*, servant). Word used in two main senses: in religion for the whole body of clergymen or ministers of a religious body and their work, *e.g.* the ministry of the Church of England; and in politics for the body of ministers of the crown, both cabinet ministers and those outside the cabinet. In 1957 the ministries of the crown (as distinct from secretaryships of state) were the following: Agriculture, Fisheries, and Food; Defence; Education; Health; Housing and Local Govt.; Labour and National Service; Pensions and National Insurance; Power; Supply; Transport and Civil Aviation; Welsh Affairs. In this sense the word was used in the 18th cent. by Swift, Wilkes, and

and it has recently been followed in Great Britain, where almost all the new departments of state are known as ministries. The board of Education, for example, was renamed the ministry of Education in 1945. In France the word is also used for the building in which the ministry is housed. For separate ministries, *see* Health, etc.

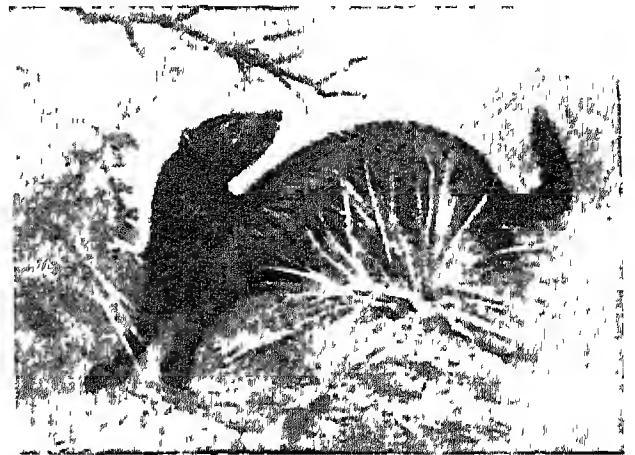
Minium OR RED LEAD. The name given to a scarlet crystalline compound of lead. It is chiefly lead orthoplumbate, $2\text{PbO} \cdot \text{PbO}_2$, and is made by heating massicot in a reverberatory furnace. Minium when itself heated changes to violet and then black, but becomes scarlet again on cooling. Ignited, it is converted into lead monoxide. It is used in the preparation of flint glass and as a paint. *See* Lead; Miniature.

Mink. Name given to three closely related species of carnivorous mammals, also called vison, belonging to the weasel (*Mustela*) genus. They resemble polecats in general form, and have soft glossy fur and a bushy tail. In colour they range from yellowish to chocolate brown, and the chin is white. They are always found near water, and feed mainly on frogs and freshwater mussels, but also catch birds and small mammals. All have a particularly penetrating and disgusting odour.

The European mink is found in Poland, Finland, and in most parts of Russia; the Siberian species occurs in the districts E. of the Yenesei river; and the American

mink is widely distributed in N. America. The fur is highly valued, especially that of Alaskan specimens, and incessant trapping has made the animals scarce.

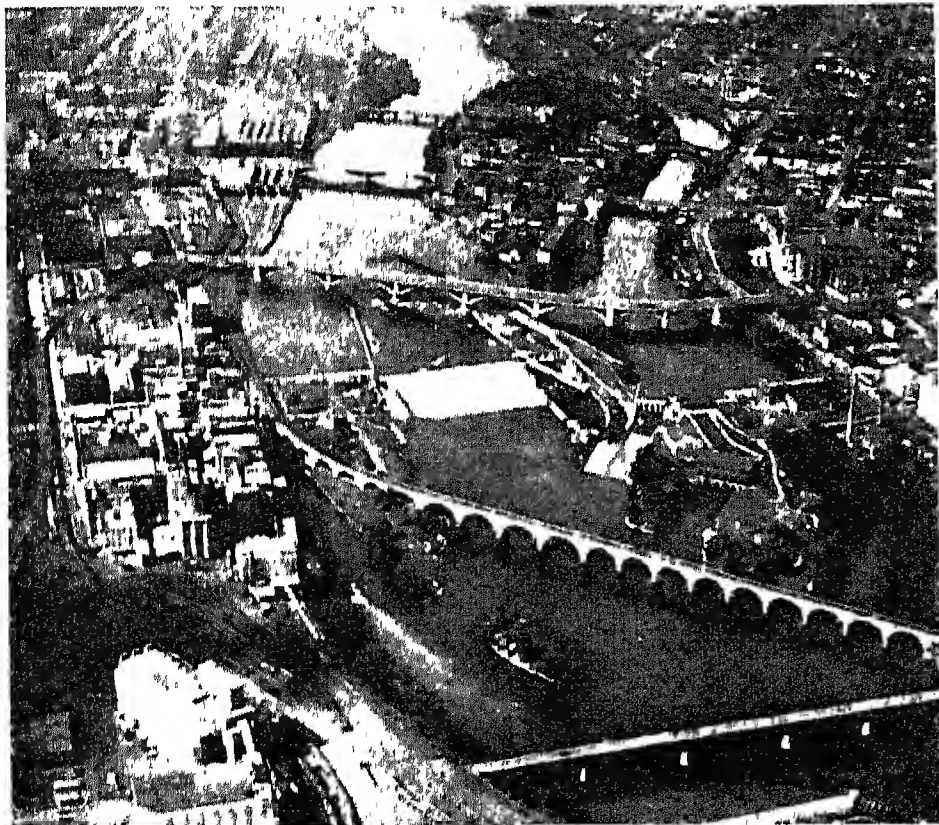
Minneapolis. City of Minnesota, U.S.A., the co. seat of Hennepin co. The largest city of the state, it stands on the Mississippi river at the Falls of St. Anthony, adjacent to St. Paul, and is served by the Chicago, Milwaukee and St. Paul, and other rlys. The city is pleasantly situated in a lake district which attracts many visitors. Among its buildings are two cathedrals, the university of Minnesota, and the Minneapolis



Mink. Specimen of the European species, *Putorius lutreola*

school of fine arts. The Institute of Arts has subscriptions of over \$5,000,000. The Minnehaha Park covers nearly 3,800 acres, and contains the falls familiarised by Longfellow's *Hiawatha*.

National pre-eminence in the wheat and flour trade began in 1880, and since 1900 one mill alone has had a capacity of 14,000 barrels of flour daily. Power for its factories is provided by the Falls of St. Anthony. A system of dams and locks, begun in 1915, have greatly increased the supply. The site of Minneapolis was visited in 1680 by Father Hennepin, who gave the Falls of St. Anthony their



others, and this use has spread from Gt. Britain to all the self-governing parts of the Empire, and to many foreign countries.

Later the word was used in another, although cognate, sense. When the various parts of the Empire obtained responsible government they, being without the historic names such as exchequer, treasury, etc., began to call their departments of state ministries. This use prevails in Canada, Australia, and elsewhere. A similar use has prevailed in France since the establishment of the Republic.



Minneapolis, Minnesota. View of the business district. On the left is the Medical Arts building, next to it the Foshay obelisk, and on the extreme right the Northwestern Bell Telephone building. Above, left, a view showing the complicated network of bridges over the Mississippi

name. Settlement began about 1847, and in 1856 Minneapolis was incorporated as a town. It became a city 11 years later, and in 1872 St. Anthony, first settled in 1837, was incorporated with it. Pop. (1950) 521,718.

Minnesinger (Ger. *minne*, love). German lyric poets who flourished for about 200 years from the middle of the 12th century. The earliest minnesinger developed the native lyric, associated with dancing, but about 1200 the influence of the Provençal troubadours modified the art. Like them, mainly of knightly or noble birth, the minnesinger formed a school of artificial and courtly lyric, with complicated metrical forms, but they differed from the troubadours in their more reverent, semi-religious treatment of love. Many were poets of nature, and some were political and social satirists. They composed the musical accompaniment to their own songs. Most of them were Swabians, or S. Germans. Among the most notable minnesinger—nearly 200 poets are recorded as belonging to the period—are Heinrich von Veldeke, Heinrich von Morungen, Wolfram von Eschenbach, Heinrich von Ofterdingen, Walther von der Vogelweide, Hartmann von Aue, and Neidhart von Reuenthal. The minnesinger were succeeded by the meistersinger (*q.v.*). There have been several collections of the works of the minnesinger in German; especially notable is one in five volumes by F. H. von der Hagen, 1838–56. See Troubadour.

Minnesota. River of Minnesota, U.S.A. Issuing from Big Stone Lake, on the South Dakota border, it flows for 450 m. first S.E. to Mankato and then N.E. to the Mississippi river, at Minneapolis, below St. Anthony's Falls. At high tide small vessels may ascend it for 295 m., and for steamers it is navigable for 45 m.

Minnesota. A northern state of U.S.A. lying to the W. of Lake Superior. The surface, mainly undulating, is marked by some 11,000 large and small lakes, including Red Lake (345 sq. m.) and Lake Itasca, from which the Mississippi river takes its rise. Other rivers include the Minnesota, Red, and St. Croix, all navigable, and utilised to supply water-power. Chiefly an agricultural state, Minnesota yields great quantities of maize, corn, and oats; the world's largest flour mills are at Minneapolis. Dairying and meat-packing are important industries, and mineral

wealth is considerable, red haematite, granite, and limestone being worked. St. Paul, the capital, and Minneapolis, the largest city, are the chief centres. The Mesabi iron range is the world's greatest iron ore district, and with the Vermilion and Cuyuna iron ranges lies in the forested heights W. of Lake Superior. Wealth from these areas reached its peak after the First Great War, and special taxation of the mining companies, fixed locally, resulted in the erection of many fine schools. The chief educational institution is the university of Minnesota at Minneapolis. The state is chiefly populated by those of foreign extraction. The small farmers and industrial workers united to form the Farmer-Labour party, which captured all but two of the state offices, and the entire Minnesota delegation to congress in 1936. This movement subsided with the approach of America's entry into the Second Great War.

Minnesota was admitted to the Union in 1858. Its area is 84,068 sq. m. Pop. (1950) 2,982,483.

Minnow (*Leuciscus phoxinus*). Small fresh-water fish, common in the rivers of Great Britain and of most parts of Europe. It belongs to the same genus as the roach and dace, and is distinguished from them by the broken line which runs along each side of the body. It varies in length from three to six inches, and is largely used as bait in angling for larger species.

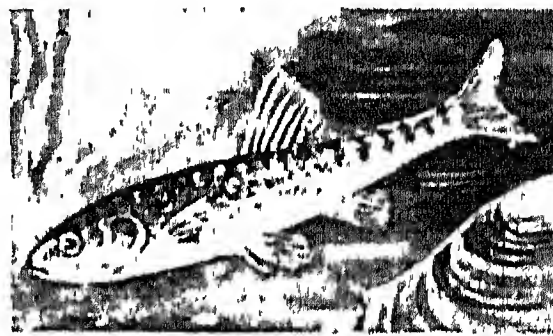
Minoan. Name given to the pre-Hellenic civilization of Crete, also called (together with that of Mycenae) Aegean. See Aegean Civilization; Crete.

Minor. In law, a person under 21 years of age. In English law the term infant is used in this sense. In Scotland a child is a pupil up to 14 (boy) or 12 (girl), then a minor up to 21. See Infant.

Minor (Lat., smaller). In music, a term applied to those intervals of the 2nd, 3rd, 6th, and 7th which are less by a semitone than the corresponding major intervals. As commonly used in connexion with scales and keys, both major and minor in their signification are obviously absurd; they are merely brief and convenient ways of referring to the scale or key with the larger or smaller 3rd and 6th which dif-

ferentiate the one from the other, and replace the older expression, "In the key of C with the greater (or lesser) third."

Minorca (Sp. Menorca). Second largest of the Balearic Isles in the Mediterranean, belonging to Spain. So called from its being smaller than Majorca, the largest island in the group, it is 25 m. to the N.E. of the latter. It is 35 m. in length, with an average width of 10 m. and an area of about 290 sq. m. The coast is indented and rocky, and the surface hilly; the highest point, near the centre, rises to 1,206 ft. Cereals, wine, oil, oranges, lemons, figs, almonds, and flax are grown; iron, copper, lead, slate, marble, alabaster, etc., mined. Cattle and horses are reared. A good road, built by the British when they were in occupation in the 18th cent., runs from Ciudadela to Port Mahon. The island is rich in stalactite caves, megalithic remains and ancient towers (*talayotes*), and other sepulchral monuments. Minorca, which had been in government hands since the beginning of the Spanish Civil War, surrendered to Gen. Franco on Feb. 9, 1939, the act of capitulation being signed on board the



Minnow. Small fresh-water fish common in British rivers

British cruiser Devonshire, which provided the only neutral place available for the negotiations. The Devonshire evacuated a number of Republicans, and while leaving the port was unsuccessfully attacked by Italian aircraft operating from a base on Majorca, already held by Franco's Nationalists. Pop. (1950) 42,478.

Minorca Fowl. Breed of domestic poultry supposed to have originated in the island whose name they bear. In reality they appear to be merely a red-faced variety of the white-faced Black Spanish breed, from which they differ also in the shorter and stouter body, shorter shanks, and larger combs. Though champion layers of large eggs, they cannot be prevailed upon to sit. See Fowl, colour plate.

Minories, THE. London thoroughfare. It runs S. from Aldgate High Street to Tower Hill, E.C., and derived its name from the abbey of the Minorettes of S. Mary of the order of S. Clare. On the abbey site was built the old parish church of Holy Trinity, rebuilt in 1706, and dismantled in 1899, when the parish was united with

that of S. Botolph, Aldgate. In a vault S. of the altar in 1851 was discovered, in tannin, the head, since preserved at S. Botolph's, supposed to be that of Edmund de la Pole, duke of Suffolk, executed 1513, or of the father of Lady Jane Grey, Henry Grey, duke of Suffolk, executed 1554. Between the 16th and 18th centuries a centre of the gunsmith trade, the Minories became a Jewish quarter. The thoroughfare figures in Defoe's *Journal of the Plague* and in Dickens's novel, *Dombey and Son*. *Pron.* Minnoriz.

Minor Interval. In music, an interval containing one semitone less than a major interval of the same degree. Thus, C-E, a major 3rd, contains 4 semitones, while C-E flat, minor 3rd, contains 3 semitones. The minor triad is the sounding together of a note, its minor 3rd, and its perfect 5th, e.g. C-E flat-G.

Minorites. Name adopted by the early Franciscan friars as an indication that they wished to be regarded as less than the other religious orders. The female branch of the order, founded by S. Clare about 1212, adopted the name of Minoreesses. They are now commonly known as Poor Clares, but the old name still survives in the Minories, London, where they had a convent. *See* Franciscans; Poor Clares.

Minorities. A political and ethnological term much used after the First Great War. It generally describes numerically inferior sections of the people embraced by one community, usually a state, and their specific legal claims. Though long existing, this problem was raised to the level of international legislation by the assertion of the right of self-determination for each distinct people, proclaimed during the First Great War, and by a number of articles in the Paris peace treaties. Thus were established certain rights for minorities, racial, linguistic, or religious. The League of Nations, entrusted with the supervision of these obligations, as well as a number of others undertaken in special treaties, e.g. between Germany and Poland, Austria and Czechoslovakia, Sweden and Finland, Greece and Turkey, Greece and Bulgaria, etc., had a special commission of its Council to deal with this problem.

In fact, with the exception of Portugal, Norway, and possibly Holland, all European countries had and have minorities; they

exceed 10 p.c. of the total population in France (Alsations of German language, Basques, Bretons, Flemings, Italians), Greece (Macedonians, Bulgars, Jews, Turks), Yugoslavia (Hungarians, Germans, Macedonians, Albanians, Turks), Poland in 1939 (Ukrainians, Germans, Jews, Ruthenians), Rumania (Hungarians, Germans, Jews, Ukrainians, Bulgars, Poles), Spain (Catalans, Basques, French, Gipsies). Czechoslovakia and Hungary solved their minorities problem summarily after the Second Great War by expulsion, as, also, to some extent, did Yugoslavia and Poland.

Historically, the struggle for minority rights started in the early 19th cent. with such conflicts as those of the Macedonians against the three states embracing them, the Finns, Poles, and Balts against Russia, and the Slavonic peoples in the Hapsburg monarchy against Austrian or Hungarian domination. From the linguistic point of view Great Britain has a minority with special claims in the Welsh movement.

A congress of nationalities, first established at Geneva in 1925 and representing about 30 different groups from several European nations, endeavoured to develop and assimilate the minority rights so far granted. The dictatorships used the minorities as means of irridentist agitation, e.g. Italians in Nice, Corsica, and Savoy, and Germans in Sudetenland, Danzig, and Memel, while oppressing the minorities within their own borders. The United Nations charter, while not expressly mentioning them, contains provisions evidently meant for the reinforcement of minority rights.

Minor Planets. A group of planetary bodies numbering over 2,000, the orbits of which lie between those of the planets Mars

and Jupiter, for the most part nearer to Mars. *See* Asteroids.

Minos. In Greek legend, king and lawgiver of Crete. He was the son of Zeus by Europa, brother of Rhadamanthus, and father of Deucalion, Ariadne, and Phaedra. His wife was Pasiphaë, daughter of Helios, who brought forth the Minotaur, which was slain by Theseus. When Daedalus fled from Crete, Minos pursued him to Sicily, where he was killed by Cocalus.

The foregoing, which is the version of the legend in the ordinary accounts, represents Minos as a monster of cruelty. Other accounts represent him as an able monarch, who made Crete a great maritime power, cleared the seas of pirates, and promoted the welfare of his subjects. After death Minos was made one of the judges of the dead in Hades. Recent archaeological discoveries throw remarkable light on the legend. The labyrinth, i.e. house of the double axe, which, like the bull, was the object of a cult at Cnossus, is probably the great palace there, with its intricate passages. A wall-painting of the Minoan age represents boy and girl athletes leaping over a bull. Both Athens and Sicily came under Minoan influence. *See* Aegean Civilization. *Pron.* My-noss.

Minot, GEORGE RICHARDS (1885-1950). American physician. Born Dec. 2, 1885, at Boston, Mass., he graduated at Harvard in 1908, and worked at the Massachusetts general hospital, 1915-23. His life was saved by the discovery of insulin in 1922. He was professor of medicine at Harvard 1928-48, and director of its medical laboratory. There, in 1926, working with W. P. Murphy and G. H. Whipple Minot found the liver treatment for pernicious anaemia. It brought them the Nobel prize for medicine in 1934 and to Minot a year earlier the Moxon medal of the R.C.P., London. Minot published *On Blood and its Disorders*, and *Dietary Deficiency*, as well as scores of papers on medical matters, especially those relating to disorders of the blood. He died Feb. 25, 1950.

Minotaur. In Greek mythology, a monster with the head of a bull and the body of a man. It was the offspring of Pasiphaë, wife of Minos, king of Crete, and a bull sent to Minos from Poseidon the sea-god. The monster was kept in a labyrinth constructed by Daedalus (q.v.), and a yearly tribute of seven youths and seven maidens from Athens was given it to devour. Theseus however, came



Minotaur. Sculpture representing Theseus slaying the Minotaur, by C. Ramey
Louvre, Paris

with one contingent of youths and maidens, and with the help of Ariadnē slew the monster and found his way through the labyrinth. See Ariadnē; Theseus.

Minsk. Capital city of White Russia S.S.R., and the headquarters of a region named after it. Minsk stands on the Svisloch, a tributary of the Beresina, and is a junction for rlys. from Poland to the R.S.F.S.R. and from Lithuania to Ukraine. It is about 300 m. N.E. of Warsaw. Here are the White Russian state University and other educational institutions. Machine tools, instruments, textiles, etc., are made. With recorded history from the 11th century, Minsk has been held by Lithuanians, Poles, Tartars, and Swedes; was destroyed by Napoleon in 1812; fought over by Bolsheviks and Poles in 1920; and seized by German troops, June 30, 1941, to be liberated by White Russian forces July 3, 1944. Pop. (est.) 235,000.

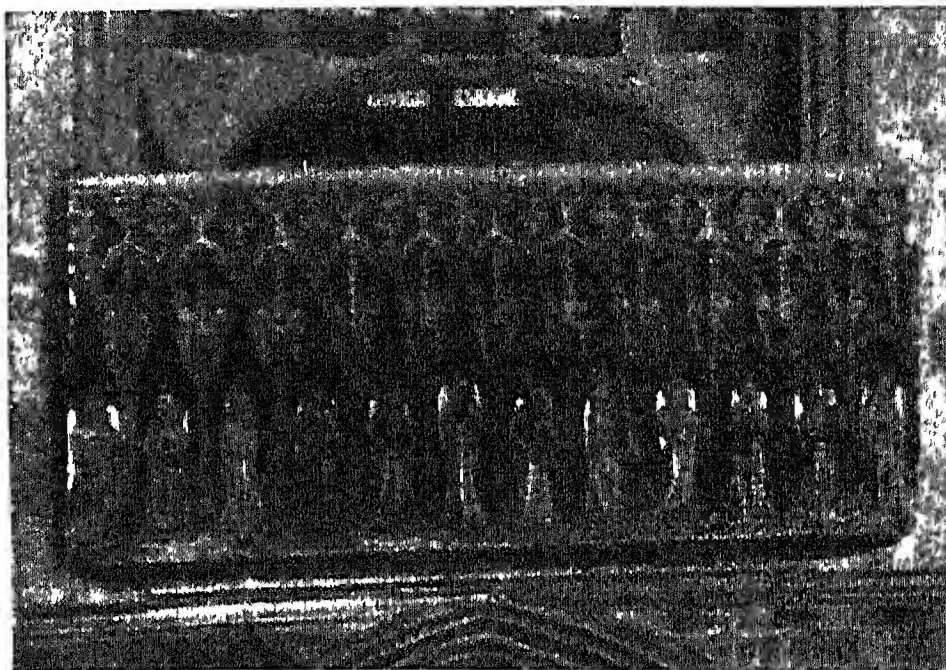
Minster (Lat. *monasterium*, monastery). Term originally applied to a church to which a monastic fraternity was attached, as at Sherborne, Wimborne, and Beverley minsters; now loosely used for the principal church or the cathedral of a city, e.g. York Minster. As a place name (or part of one, e.g. Westminster) it indicates that the place grew up round a monastic house. The German term *Münster* is used for cathedrals in the Protestant cities of Switzerland and the Rhineland.

Minster or MINSTER-IN-SHEPPEY. Village and parish of Kent, England, on the Isle of Sheppey, 3½ m. S.E. of Sheerness. S. Mary's church, part of which is Saxon, is a fine building. There are some few remains of a convent which existed here in the Middle Ages. Oysters are cultivated. Pop. (1951) parish 7,338.

Minster or MINSTER-IN-THANET. Village and parish of Kent, England. It is 4 m. W. of Ramsgate. S. Mary's church has beautiful Norman and E.E. work. the nave, tower, and misericorde stalls being notable. About 700 a monastery was founded here, and later another was dedicated to SS. Peter and Paul. Both were destroyed by the Danes, and the present church is the successor of the one belonging to the older monastery. Pop. (1951) parish, 3,921.

Minster Lovell. Parish of Oxfordshire, England, on the river Windrush, between Witney and Akeman Street. The ruined moated manor house is said to

have been built by William, 11th Baron Lovel, and there is a legend that his descendant, Francis, 13th baron and 1st Viscount Lovel, a Yorkist, died of starvation in a secret chamber while hiding after



Minstrels' Gallery in the nave of Exeter Cathedral, an example of 15th century work

the battle of Stoke in 1487. A skeleton, believed to be his, was found in a walled-up room in 1708. The manor house was bought in 1946 by the duke of Norfolk. The 15th century Perpendicular church was once a cell to the French abbey of Ivry. It contains interesting monuments and brasses and was restored about 1865.

Minstrel (old Fr. *menestrel*, one who ministers). Singer or performer on a musical instrument, or both, in the Middle Ages. Corresponding with the Anglo-Saxon scōp or gleeman, of whom Widsith (*q.v.*) was a type, the minstrel proper, or jongleur, came to England at the Norman conquest. Minstrels were at first executants rather than poets, though they might be both. Frequently a company of minstrels attended on a troubadour to render his work. Their popularity may be gauged from the frequency with which they were depicted in manuscripts, and by the minstrels' gallery (*v.i.*).

Minstrels were largely the retainers of noble families, and those unattached were welcome guests at the houses of the rich wherever they wandered. The decline of chivalry, the spread of printing, and probably also the rise of the drama, combined to bring about the decline of the minstrel, and he drifted into one of the wandering classes treated as vagabonds and beggars in the time of Elizabeth I. In the remote parts of the country the minstrel lingered on for some time, and Scott in *The Lay of the Last Minstrel* shows his minstrel singing of Border chivalry as late as the reign of William III. Consult English Wayfaring Life in the

Middle Ages, J. J. Jusserand, Eng. trans., 1891; History of English Poetry, Courthope, 1895-1910.

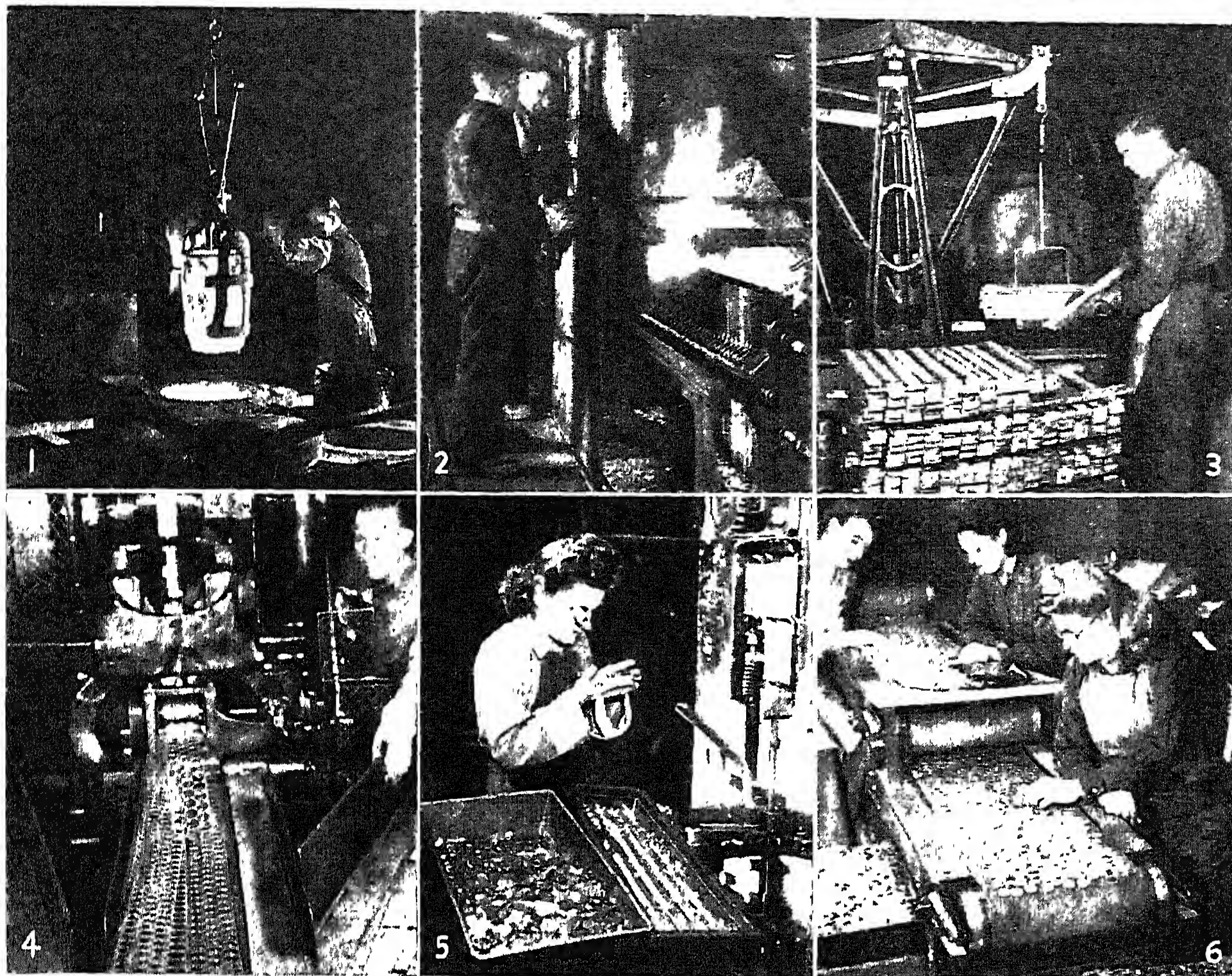
Minstrels' Gallery. In the medieval mansion, a gallery or balcony (*q.v.*) projecting into the hall (*q.v.*), for the use of the professional minstrels attached to the household. Underneath was usually a passage, screened off, and communicating with the kitchen and buttery. The gallery was a common feature of Plantagenet and Tudor halls, and good examples remain at Oxford and Cambridge.

Mint (*Mentha*). Genus of perennial herbs of the family Labiatae, widely distributed outside the tropics. They have creeping rootstocks, square stems and branches, pungent aromatic leaves, and purplish flowers in whorls. Ten species are recognized as natives of Great Britain, of which the most important are peppermint (*M. piperita*), yielding the essential oil of the same name (*q.v.*); pennyroyal (*M. pulegium*); spearmint or lamb-mint (*M. spicata*), grown in gardens for making mint-sauce, and yielding oil of spearmint. Menthol is obtained from *M. arvensis*. A supply of green leaves may be obtained through the winter by maintaining the plants in a temp. of 60°F.

Mint (Lat. *moneta*). Government office where money is coined. The British mint dates from Anglo-Saxon times, when mints were scattered all over the country. Gradually their number was reduced, until early in the 18th century all coins for the three kingdoms were minted in London. The present building of the Mint on Tower Hill was erected in 1810. From 1851, when complete control was taken over by the government, to 1870 the master of the mint was a permanent officer, discharging his duties in person. By the coin-



Mint. Flowers and leaves of water mint



Mint. Processes of coining silver in the Royal Mint. 1. Crane carrying a glowing crucible of molten metal to the mould. 2. Pouring molten silver into the bar moulds. 3. Silver-coinage bars being weighed after leaving the mould. 4. Punching machine which produces plain metal disks. 5. Coin-press operator: at this machine disks are turned into coins. 6. Finished coins passing along an endless belt, closely scrutinised by examiners

age Act of 1870), the mastership of the mint was vested in the office of chancellor of the exchequer, without emolument, all duties to be performed by a permanent head of the department under the title of deputy master. Earlier Sir Isaac Newton was master of the mint, and made much money by contracting for the supply of coins. There are branches in Australia at Melbourne and Perth.

The method of manufacturing gold and silver coin at the Royal Mint, London, is approximately as follows: The refined metal is melted in plumbago crucibles and poured into iron moulds. The bars thus formed are passed between cast-iron or steel rollers until they are of the requisite thickness, being kept soft by annealing. The weight of the flattened bars called "fillets" is tested on disks punched out of each fillet by the "tryer," who decides whether they are within the "remedy," i.e. the small margin within which coins in minting are permitted to vary from the standard weight.

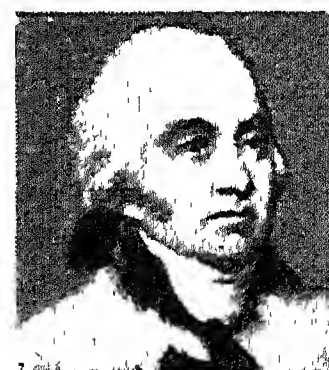
After the trial disks have been passed the fillet is put through the

cutting machine, in which two steel cylinders, driven by an eccentric, punch out from the fillet disks known as blanks and force them into two holes in the bed of the machine, the fillet being pushed along automatically until all the blanks are cut out. The metal left over, known as scissel, is remelted. The blanks are then marked, i.e. the edges are thickened so as to form a rim, and the diameter reduced by being placed between a revolving steel plate and a fixed block. Formerly the edges were marked with an inscription. After being annealed, the blanks are washed in water and dried in sawdust, the oxide of copper deposited on the silver blanks being then removed with hot dilute sulphuric acid.

The blanks then go through the coining press, a modified form of the original Uhlhorn lever press. Each is placed on a fixed engraved die and subjected to pressure from another engraved die, being held meanwhile in a collar which produces the crenated (milled) or engraved edge—a precaution against clipping or filing. The

blanks, having received the necessary impressions from the dies and collar, are now coins. After being rung the finished coins are weighed on the automatic balance, a modification of that designed in 1843 by William Cotton, deputy governor of the Bank of England. Faulty coins are remelted. Sample coins are collected in a pyx or box, and annually weighed and assayed by the Goldsmiths' Company—the so-called trial of the pyx. The crown alone has, through parliament, the prerogative of coinage. Consult *The Mint*, Sir John Craig (former deputy master), 1953.

Minto, GILBERT ELLIOT, 1ST EARL OF (1751–1814). British administrator. The eldest son of a baronet of Minto, Roxburghshire, he was born in Edinburgh, April 23, 1751, and educated at Fontainebleau, Edinburgh, and Oxford. He was called to the bar at Lincoln's Inn, 1774, and in



1st Earl of Minto, British administrator



Minton Ware. Vase, about 1860, from the Herbert Allen Collection
Victoria and Albert Museum

1776 was returned to parliament for Morpeth. During 1777-84 he represented Roxburghshire. At first a Whig, he joined the opposition in 1782. He helped Burke in framing the case against Warren Hastings and Sir Elijah Impey. In 1790 he was returned M.P. for Helston, and was viceroy of Corsica, 1794-96, and governor of India, 1807-13. Created earl of Minto and Viscount Melgund in 1813, he died at Stevenage, June 21, 1814, and was buried in Westminster Abbey. *Consult* Life and Letters, 3 vols., 1874, edited by his great-niece, the countess of Minto.

Minto, GILBERT JOHN ELLIOT-MURRAY-KYNNYMOND, 4TH EARL OF (1847-1914). British adminis-



4th Earl of Minto, British administrator

trator. Born July 9, 1847, son of the third earl, whom he succeeded in 1891, he was educated at Eton and Cambridge, and joined the Scots Guards in 1867, retiring in 1870.

He served with the Turkish army, 1877, and with the British in the Afghan War, 1879, was private secretary to Lord Roberts at Cape Colony in 1881, and was a volunteer in the Egyptian campaign, 1882. Military secretary to Lord Lansdowne, the governor-general of Canada, 1883-85, he was chief of the staff to the government forces in the rebellion of 1885. Minto was governor-general of Canada, 1898-1904, and during 1905-10 viceroy of India, where his contribution to history was made in the Morley-Minto reforms. He died March 4, 1914, and was succeeded in the peerage by his son,

Victor, Viscount Melgund (b. Feb. 12, 1891). A memoir by John Buchan appeared in 1924.

Minton Ware. Soft and hard paste porcelain were made at Stoke-upon-Trent. The Mintons were making semi-transparent china in 1790. In 1825 they reverted to a white-bodied earthenware, with printed design and a new borax glaze. After further experiments they produced both soft and hard paste porcelain, artistic in design and decoration. Parian ware was also made. The Mintons also introduced encaustic tiles in various styles, majolica, Palissy ware, and admirable della Robbia plaques and panels, all remarkable for the excellence of body, design, colouring, and the permanence of the non-poisonous glazes. *See* Pottery.

Minucius Felix, MARCUS. A Latin writer and Christian apologist. A lawyer, he practised in the Roman courts. His only known work is the *Octavius*, a dialogue between a Christian and a pagan, at the end of which the pagan announces himself converted. The Christianity expounded by Minucius is of broad type; apparently he wrote to influence the educated of his time, to whom he presents Christianity rather as a system of philosophy than as a religion. The author's nationality and the date of the *Octavius* are uncertain.

Minuet (Fr. *menuet*). Dance for two persons in three-four time. It originated in Poitou, and was developed from the courante (*q.v.*), being more ceremonious and stately than that dance. It was introduced into Paris in 1650, shortly became the most important dance of the court, and has ever since been regarded as the highest form of dancing. There were four variations upon the original dance, the one most used being *Le Menuet de la Cour*. As a musical composition the minuet occurs in suites of Bach and Handel, and in symphonies of Haydn and Mozart where it is the forerunner of the scherzo. *See* Dancing.

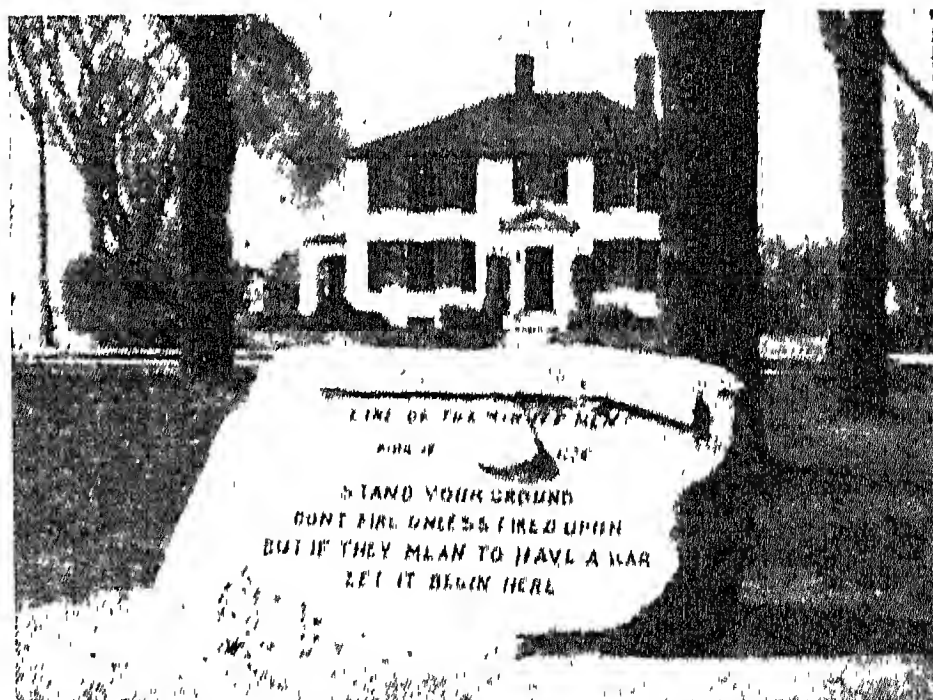
Minuscule. Term applied to the letters of the small cursive writing which the monks of the 7th-9th centuries developed out of the

previous uncial characters, which are larger and like modern capitals. From the minuscule script were evolved the modern small or lower case letters, called minuscules. *See* information under each letter of the alphabet.

Minusinsk. Town of Siberia. In Krasnoyarsk territory, R.S.F.S.R., it is 165 m. S.S.W. of Krasnoyarsk, on the Yenesei R. Terminus of a branch rly. from the Trans-Siberian main line, it is served by steamer. There are tallow boileries and tanneries, and trade in corn, cattle, and gold washings. The Minusinsk basin is a rich coal-yielding area.

Minute. In the measurement of time, the sixtieth part of an hour. Minute is also the term for the sixtieth part of a degree of a circle, *i.e.* a minute of an arc, and in architecture the sixtieth part of the diameter of the shaft of a classic column. The minute of arc and the minute of time both contain 60 seconds, and the usual abbreviation for the word is the mark '. *See* Degree; Hour; Time.

Minute-Men. Popular name given during the American War of Independence to the militia men who pledged themselves to take the field at a minute's notice. A



Minute-Men. Stone erected at Lexington, Mass., marking the line occupied by the minute-men at the first engagement in the War of Independence. It is inscribed with the words of their commanding officer, Captain J. Parker

bronze statue, *The Minute Man*, by a Concord sculptor, Daniel French, representing a farmer still at the plough, but grasping a flint-lock musket, stands at one end of the North Bridge at Concord, Mass., which was the first place on which the British marched. *See* Concord, Battle of; Lexington, Battle of.

Minutes. Business term for a summary of the proceedings of the meetings of a company, committee, or other body of persons acting in a joint capacity. The record is put down in a minute book by the secretary, and the custom is that

at every meeting the minutes of the last meeting are read before other business is proceeded with. If accepted as a correct account, the minutes are then signed and passed, and a continuous record of the transactions of the company or society is kept. By the Companies Acts, limited companies must keep minutes of their general meetings and of those of their board of directors. In the U.K. a Treasury minute is the name given to an official memorandum issued from the Treasury.

Minya. A province in Upper Egypt, area 782 sq. m. It takes its name from a town on the left bank of the Nile, 140 m. S. of Cairo. The estimated population in 1955 was, prov., 1,100,000; town, 80,000. There are several variant spellings of the name.

Minyans. Primitive seafaring people of the Mycenae age of Greece. They were established at Orchomenos, in the marshy basin of the Copais, and farther north at Ioleus, under Mt. Pelicon, whence Jason sailed for the Black Sea in quest of the Golden Fleece.

Miocene (Gr. *meiōn*, less; *kainos*, recent). In geology, the period between the Oligocene and Pliocene systems of the Cainozoic or Tertiary era. It probably occurred between 15 and 35 million years ago. There are no deposits of this age in Great Britain, but elsewhere in Europe and America they are important, particularly in Switzerland, where the Molasse deposits were derived from the erosion of the Alps as they were being uplifted and thrust northwards. The Miocene was a period of great earth movements; then came the major folding of the present-day European and Asiatic mountain ranges—Alps, Caucasus, Carpathians, Balkan and Dalmatian Mts., Himalayas. These movements being felt in England were recorded by the folding of the Wealden dome and the London and Hampshire basins. On the W. coast of America the Miocene was a period of intense volcanic activity.

The temperate climes were undoubtedly much warmer than at present, striking evidence being the formation of Miocene coal deposits in Greenland. The mastodon, dinotherium, rhinoceros, etc., were among the larger animals of the plains, and also an early ancestor of the horse, the three-toed protohippus, and hippotherium. The lower Miocene beds of Kenya have yielded fossil remains of primates, including the jaw (found in 1946) of the species *Proconsul*,

which in some respects resembles a human jaw more closely than that of a modern ape, and may indicate that the common ancestor of man and the apes is to be found in Africa. See Horse; Pliocene.

Miösen OR MJÖSEN. Largest lake of Norway. It is situated about 38 m. N. of Oslo, and extends about 60 m. in a N. direction. Its width varies from 2 m. to 10 m., and its maximum depth is 1,480 ft. The Lougen river flows into it, and it discharges into the Glommen by the Wormen. It contains a fertile island, 10 m. round.

Miquel, JOHANNES VON (1829–1901). German statesman. Of French descent, he was born at Neuenhaus, Hanover, Feb. 19, 1829, and studied law at Göttingen and Heidelberg. He was



J. von Miquel,
German statesman

elected to the Hanover diet in 1864. He was on the governing body of the Diskontogesellschaft in Berlin, 1870–73, was a leading member of the National Liberal Party in the Prussian chamber of deputies, 1867–82, and entered the Reichstag in 1887. From 1890 to 1901 he was Prussian minister of finance, chosen by William II. In 1897 he was raised to the nobility and made vice-president of the Prussian ministry. Opposed by Bülow, he resigned office, and died at Frankfurt Sept. 8, 1901. *Pron.* Mee-kei.

Miquelon, GREAT AND LITTLE. Islands off the S. coast of Newfoundland, forming, with the St. Pierre group, an overseas territory of the French Union. The is. are connected by a strip of sand, 5½ m. long, and have an area of 83 sq. m. (with the St. Pierre group, 93 sq. m.). Barren and rocky, they support a declining cod-fishing industry. St. Pierre is the capital. Between 1713 and 1816 they were four times appropriated to England and as often restored to France. Adm. Muselier of the Free French landed on Dec. 24, 1941, dismissed the governor, a Vichy partisan, and announced the adherence of the group to the cause of Free France. Pop. 550.

Mira. In astronomy, the name given to the first known variable star. Discovered by David Fabricius, 1596, who announced it as a new star, it fluctuates in brightness from the second to the ninth magnitude during a period of about 332 days. Neither the maximum and

minimum brightness nor the period are constant, and the causes for the changes are unknown. Spectroscopic examination has established that the change is a physical one confined to the star itself and probably not due to the regular eclipse of a dark companion. The star is also known under the name Omicron Ceti. See Stars.

Mirabeau, ANDRÉ BONIFACE LOUIS RIQUETI, VICOMTE DE (1754–92). French politician. A brother of the great Mirabeau (*v.i.*), he was born at Bignon, Nov. 30, 1754, and became an officer of dragoons. He served in the American War of Independence, became colonel of the regiment of Touraine, 1788, and was deputy for the noblesse of Limoges to the states-general in 1789. He was a vehement opponent of reform and of his brother's policy, and from his figure and hard-drinking habits was popularly known as Mirabeau-Tonneau (*i.e.* barrel). After his attempt to suppress an insurrection in his regiment at Perpignan, 1790, he was arrested, but on release joined the emigrés in the Rhineland. He died at Freiburg-im-Breisgau, Sept. 15, 1792.



Vicomte de Mirabeau,
French politician

Mirabeau, GABRIEL HONORÉ RIQUETI, COMTE DE (1749–91). French statesman. He was born



Comte de Mirabeau,
French statesman
After Couderc in
Versailles Museum

March 9, 1749, at Bignon, either in Provence or near Nemours. In a stormy youth he distinguished himself as a reckless rebel against social and moral conventions. Ugly and pock-marked, he yet exercised irresistible fascination. Though married, he ran off with Mme. de Monnier, to Switzerland and Holland, where he worked as a literary hack. He was imprisoned in 1777 at Vincennes, where he wrote the licentious Letters to Sophie. When the Revolution broke out he was rejected by the nobility of Provence but returned by the people for both Aix and Marseilles. An aristocrat by birth, he sprang at once into the leadership of the third estate when the states-

general met on May 5. Under his leadership the third estate refused to allow itself to be adjourned. But there were few who could grasp the ideal for which Mirabeau was striving—a strong constitutional government, free alike from the incubus of aristocratic privileges as well as from the anarchy of uneducated democracy.

His efforts failed to break down the prejudices of the monarchists and to open the eyes of formal constitutionalists to the real situation, and caused him to lose popularity with what was rapidly becoming the party of reckless revolution. He could not win the confidence of the king and queen, who under his guidance might have directed reforms by which alone the revolution could have been averted. Of tremendous energy and practical skill, Mirabeau disputed with Danton the title of the greatest orator of his day, though secretaries wrote many of his speeches. But the strain of the gigantic task which almost unaided he had taken upon his own shoulders, was too great; and on April 2, 1791, he died. See French Revolution; National Assembly. *Pron.* Meerabo.

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Mirabeau, VICTOR RIQUETI, MARQUIS DE (1715–89). French economist. Of Provençal descent, he was born at Pertuis, Vaucluse, Oct. 5, 1715, and served in his youth as an officer in the army. From about 1743 he devoted his attention to economic



Marquis de Mirabeau,
French economist

questions, being a follower of Quesnay (*q.v.*), and notable among the so-called physiocratic school of economists. Among his publications were his popular *L'Ami des Hommes*, 1750–60; *Théorie de l'Impôt*, 1760, for which he suffered a short term of imprisonment; *Les Économiques*, 1769–72; and *La Science*, 1774. A man of extravagant tastes and fiery passions, the marquis was notorious for quarrels with his wife, Marie de Vassan, and with

his son Gabriel Honoré (*n.s.*). He died at Argenteuil, July 13, 1789.

Mirabilis OR MARVEL OF PERU. Genus of perennial plants of the family Nyctaginaceae, natives of tropical America. The flowers are



Mirabilis. Foliage and flowers of this tropical American plant

yellow and red, sweet scented, and bloom from May till Oct. Readily raised from seed, and often treated as half-hardy annuals, they flourish best in light soil.

Miracle (Lat. *miraculum*, a marvel). Event transcending the known laws of nature. It is convenient to use the term, in a narrower sense, for all those actions of God which do not conform to the order of nature as it is known by scientific observation, experiment, and induction. Whether there is, or is not, such action, is a question of evidence; but here we are concerned only with defining a conception as exactly as language will allow.

A miracle is a supernatural act of God in this narrower sense of the term. God may be thought of as acting supernaturally, either in the soul of man, or in the world around. Although the word miracle is sometimes applied to such an inward experience as conversion, it is convenient to confine the term to an outward event. The miracle has been described by conservative theologians as an act of God contrary to the order of nature, a violation of natural laws, and an interference with natural forces.

But more theologians have been careful to explain that a miracle need not be contrary to the natural order, although inexplicable by that order in so far as we have knowledge of it. Some have maintained that it may be an occasional manifestation in that natural order of a vaster and greater order, which as a whole is at present inaccessible to our senses or our reason. The negative aspect of a miracle is that it is

inexplicable by our present knowledge of nature; and the positive aspect is that, owing to its close connexion with God's self-revelation in inspired persons, it is to be regarded as God's act, not contrary to, and yet not conformable with, that wider activity of God which theism recognizes in the whole order of nature.

Only a deistic conception of God's relation to nature, which places God not only above but even outside nature as a closed system, can exclude the possibility of miracle. A theistic conception which represents God as no less immanent than transcendent, no less in and through than above and beyond nature, may distinguish two modes of divine activity, and may describe them, in developing an analogy between God and man, as habitual and original. Just as a man may in most of the affairs of life and business follow a routine, and yet, when the occasion demands it, may show a fresh activity to meet a new emergency, so may God be conceived as acting generally in the fixed order of nature, but exceptionally departing from that order, not to disturb it, or destroy it, but to meet demands of His wisdom and goodness that it could not fully satisfy.

The analogy may take us a step farther. If a man is fulfilling a purpose for himself or others that falls beyond and above the ordinary occupations of his life, it may be necessary for him more frequently to depart from his usual habits. If God is fulfilling a purpose of self-revelation in truth and grace for the redemption of man from sin and its consequences in this world, it may be in like manner necessary that He should act in ways that do not conform to His ordinary working in nature. We should with reason suspect an alleged miracle that had no connexion with, and served no recognizable purpose of, God.

Further, as in putting right something in his own affairs or those of others which has gone seriously wrong, a man may be forced to act very differently from the way in which he would have acted otherwise, so sin with its consequences may be regarded as so serious a disturbance in God's world that very drastic measures for its removal may be necessary. A revelation of God which was intended to convey to man a more adequate knowledge of God than the world can supply, and a redemption of man which aimed at delivering man from sin as nature could not,

might altogether reasonably be expected to reach beyond nature's bounds in the means it used, and to draw more directly from the unexhausted resources of God. As belonging then to the divine revelation and human redemption in Christ, miracles become both intelligible and credible. Their possibility is certain, their necessity probable, and we can approach the question of their actuality without any hostile bias.

Against Hume's contention that a miracle *per se* is so incredible that we must regard all evidence in favour of miracles as untrustworthy, we may set the considerations which have just been offered. His bold assertion "it is contrary to experience that a miracle should be true," is an irrelevant truism, if what he means is experience generally, as the very conception of miracle assumes that miracle is not an ordinary event, and it is a reckless begging of the question if he means *all* experience without any exception, since even Mill admits that there is "a certain amount of positive evidence in favour of miracles." His demand that the testimony should "be of such a kind that its falsehood would be more miraculous than the fact which it endeavours to establish," may be met by insisting that it is less improbable that miracles should occur than that the Christian religion should rest on the shifting sand of credulous superstition, and that the Gospel records should be a tissue of falsehood.

O.T. and N.T. Miracles

About the miracles recorded in the O.T. Christian faith is not first of all, or most of all, concerned. If the miracles of Jesus are not adequately attested, the evidence in the O.T. will still less bear close scrutiny. If the miracles of Jesus are intelligible and credible, the O.T. records can be examined without any prejudice. Harnack in his book *What is Christianity?* seeks against an extreme scepticism to defend the trustworthiness of the Gospels by admitting the healing ministry of Jesus, and accounting for the cures regarded as miraculous by the mysterious power which one personality can exercise over others in certain abnormal nervous conditions, what Matthew Arnold called moral therapeutics.

As modern medical science fully acknowledges, faith in the healer is in such nervous disorders a real cause of cure. A medical writer, Dr. R. J. Ryle, however, showed in an article in the *Hibbert Journal*,

on *The Neurotic Theory of the Miracles of Healing* (vol. v, p. 585), that very many even of the healing miracles cannot be regarded as falling into the class of diseases capable of such treatment. The nature miracles remain unexplained.

Harnack further justifies his rejection of miracles by insisting on the credulity of the age in respect of such extraordinary occurrences, and the absence of the modern scientific conception of the uniformity of nature. Apart from the records of miracles, the Gospels give the impression of writings in which truth of fact as well as truth of thought and life is valued, and in which the intention to record only what is true is honestly carried out. If the evangelists had been as credulous as is suggested, we should have had not only a greater number of miracles, but the records would have been of an extravagant character, not marked by the reserve and sobriety which we do find. See *Incarnation: Jesus; Resurrection. Consult Miracles in the N.T., J. M. Thompson, 1911; The Miracles of Jesus, E. O. Davies, 1913; Miracle Stories of the Bible, A. Richardson, 1943; Miracles, C. S. Lewis, 1947.*

Miracle Play. Type of medieval religious drama, often drawn from the legends of the saints. It cannot be strictly distinguished from the mystery play. The Latin comedies of Hroswitha (*q.v.*), based on legends of the saints, afford an early example. Miracle plays were from the first less associated with worship than the mysteries, and were usually acted—at first in Latin—by young clerics, boys, and even girls, on the eve of the saint's day. The earliest dramatic performance on record in England was a play of S. Katherine, written for his pupils by Geffrei, a Norman schoolmaster at Dunstable, about 1100. They were frequently acted in London about 1170. There are but scanty remains of English plays of this type, which appears to have been much less popular than the mystery. The Christmas play of S. George, still acted by boys in English villages, is a degenerate survival. The Cornish *Life of S. Meriasek* is of Breton origin.

Many French miracle plays are extant. Thirteenth century examples are Ruteboeuf's *Theophilus*, and the *S. Nicholas* of Jean Bodel of Arras. There is a collection of 40 miracles of the Virgin of the 14th century. These early plays are far more concise and dramatic than the unwieldy mystery plays of the 15th century, but resemble

them in the introduction of comic relief. There are also German and Italian miracle plays. The Persian religious drama of Hasan and Hosain, still often performed, presents close analogies to the miracle play. See *Drama: Morality; Mystery Play. Consult English Dramatic Literature, vol. i, A. W. Ward, 1875; English Miracle Plays, a collection edited by A. W. Pollard, 1890; English Religious Drama, K. L. Bates, 1893; The Medieval Stage, E. K. Chambers, 2 vols., 1903; English Miracle Plays, E. H. Moore, 1907.*

Mirage. Optical illusion produced by the refraction of light. It occurs when successive layers of air have different densities as a result of temperature differences. The most perfect images are seen in hot, sandy deserts and on the sea. In the former, lakes often appear to be mirrored in the sand, while on the sea inverted images of ships are sometimes seen, though no ship be in sight on the ocean.

The phenomenon is explained by the fact that a ray of light is bent when it passes from one medium into another. If, therefore, a ray passes through a series of layers differing continuously in density the path of the ray becomes a curve. The air is normally of greater density over the surface of the earth than at an altitude, and when to this permanent variation there are added temporary local variations caused by the ascent of heated air, abnormalities of visibility arise. Over a heated desert, for example, the hot air near the surface expands, its density decreases, and the refractive index of the lowest layer of air becomes small. The ordinary state of affairs is therefore reversed, but at some point above the surface normal conditions reassert themselves and the density and the refractive power decrease again. Any object viewed across such a heated area is thus seen by two sets of light rays, and an inverted and usually distorted image is visible, apparently floating on the sand. Mirages may be seen over tarred road surfaces on hot, windless days.

In polar regions another type of mirage is observed. Ships, icebergs, etc., appear to be suspended upside down in the clouds. Here the illusion is produced by a large gradient of refractive index, which is, in turn, caused by a warm layer of air resting on a colder one. Upper rays reaching the eye appear, therefore, to come from a ship inverted in the clouds. See *Light; Looming; Optics.*

Mirāj. Town of Bombay, India. Two former states, Mirāj senior and Mirāj junior, are now merged in Bombay state. The former covered 368 sq. m., and had a pop. of 108,547; the latter had an area of 194 sq. m., and pop. 46,295. The town lies near the Krishna on the rly. from Poona to Belgaum, and is the junction of the line to Kolhapur. Pop. 27,000

Miramichi. River of New Brunswick, Canada. It rises near the centre of the prov., and flows N.E. to its outlet in Miramichi Bay, Gulf of St. Lawrence. Its chief tributaries are Little South West Miramichi, North West Miramichi, and Cain. All the streams are noted for their salmon fisheries. Length, 225 m., of which 55 m. are navigable, and 15 m. tidal.

Miramichi Bay. Indentation on the coast of New Brunswick, Canada. It is one of the largest arms of the Gulf of St. Lawrence, and receives the waters of the Miramichi river. Beaubair, Fox, Passage, and Neguac are long narrow islands which form an almost perfect barrier in a curve across the mouth of the bay.

Miranda. Maritime state in N. Venezuela, fronting the Caribbean Sea. It is mountainous in the N., but other parts are extremely fertile, containing some of the best coffee-growing districts in the republic. The capital is Los Teques. Area, 3,068 sq. m. Pop. 227,604.

Miranda. Character in Shakespeare's comedy *The Tempest* (*q.v.*). Daughter of Prospero, the exiled duke of Milan, she lives with him on his island. In the play, at the age of sixteen, she becomes the instrument of Prospero's reconciliation with his old enemies. She is one of Shakespeare's most charming heroines.

Miranda, FRANCISCO ANTONIO GABRIEL DE (1750-1816). Venezuelan patriot. Born at Caracas, March 28, 1750, he took part in the U.S. War of Independence, 1778. He later entered the French Republican army, and fought against Prussia, 1792-93. During the Terror he fled to England, where he tried to gain support for his project for freeing Venezuela from the Spanish yoke, 1797-1804. After an ineffectual attempt to organize a rising in 1806, he landed again in South



F. A. G. de Miranda,
Venezuelan patriot
From a bust

America in 1810, was everywhere successful, and the following year Venezuela declared her independence. He was made dictator, but the following year serious dissensions arose; Miranda was defeated, handed over to the Spaniards, and, after five years in prison in Cadiz, died July 14, 1816.

Mirandola. City of Italy, in the prov. of Modena. It is 20 m. by rly. N.N.E. of Modena. The cathedral and communal palace date from the 16th century. The ruined castle of the Pico family, owners of Mirandola from the 14th century to the 18th, the churches of S. Francis and Jesus (slightly damaged in the Second Great War), and various antiquated buildings give it a picturesque appearance. Trade is carried on in rice and silk.

Mirandola, GIOVANNI PICO DELLA (1463-94). Italian philosopher. He was born Feb. 24, 1463, at Mirandola, near Modena, and was considered one of the chief orators and poets of the time when only ten years old. He was the author of 900 theses *De omni re*



Pico della Mirandola,
Italian philosopher

scibili (Concerning everything that can be known), some of which were condemned as heretical. Mirandola retired to Florence, where he died Nov. 17, 1494. See *The Renaissance: Studies in Art and Poetry*, W. Pater, 1910.

Mirbeau, OCTAVE HENRI MARIE (1850-1917). French writer and dramatist. He was born, Feb. 16, 1850, at Trevières, and early adopted socialist and anti-clerical views. His *Lettres de la Chaumière*, 1886, gained him fame which was turned to notoriety by his *La Calvaire*, 1887, and *Sebastien Roch*, 1890, the latter work attacking the Jesuits. As a dramatist he is best known for two plays: *Les Mauvais Bergers*, 1897, which deals with social problems; and *Les Affaires sont les Affaires*, of which an English adaptation was made in 1905. Died Feb. 16, 1917.

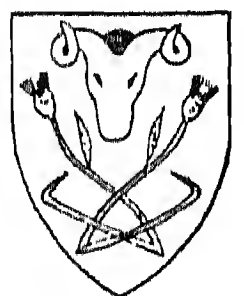
Mircea (d. 1418). Prince of Wallachia, 1387-1418. Son of Radu II, he succeeded his brother as voivode and did homage to the king of Poland, 1389, and to the Turks in 1391. Notwithstanding this he was banished by the latter, and allying himself to Sigismund of Hungary in 1395, was defeated with him by the Turkish army of Bayazid I at Nicopolis, 1396. A

supporter of Musa in his struggle for the Turkish crown after the capture of Bayazid I by Timur in 1402, Mircea regained his power in Wallachia, but thereafter continued to pay tribute to Turkey.

Mirdites. Tribe of N. Albania. They number perhaps 25,000 and inhabit the mountainous region to the S.E. of Scutari (Shkoder), with their chief centre at Oroshi. Their territory is called Mirdita. Of the several tribes of N. Albania they are politically and numerically the chief. Backward in culture and in religion Roman Catholic, they have always opposed Turkish and other attempts to absorb them. They have hereditary chiefs known as capidans, descended from the house of John Marco. In 1868, when Prenk, son and successor of Bib Doda, the late reigning chief, was captured by the Turks and held as a hostage, the Mirdites refused to supply men to the Turkish army. The Turks after some time released Prenk, who as the result of his double-dealing with them involved his tribesmen in conflict with Turkey. The latter dispatched two punitive expeditions which ravaged their territory. Prenk was captured by the Turks in 1880 and banished. Another chief belonging to the ruling family was chosen, but his unpopular rule brought about anarchy. Prenk ultimately returned, but was assassinated in 1919. See Albania.

Mirfield. Urban dist. of the W. Riding, Yorks, England. It stands on the Calder, 5 m. N.E. of Huddersfield, and is served by two rly. lines and a canal. The chief building, S. Mary's church, dates from 1825 but embodies the tower of a 13th century church. An industrial centre, Mirfield has manufactures of woollen and cotton goods, and malting is an industry. Water is supplied by the Huddersfield corporation. Mirfield is mentioned in Domesday. Market day, Friday. Pop. (1951) 11,885.

Mirfield Community. Anglican religious order for priests, known as the Community of the Resurrection. Founded in 1892 at the Pusey House, by Dr. Gore, the community removed to Radley in 1893, and in 1898 to Mirfield (*v.s.*). Its members are occupied in mission preaching, holding retreats, training candidates for Holy Orders, and literary work. Buildings have been erected for a theological college, the course



Mirfield arms

occupying five or six years. The charge is low, and repayment may be spread over six years after ordination. Half the cost of training is borne by the society. There are branch houses at Johannesburg, set up 1903, and London, 1914.

Miri. Seaport of Sarawak, British N. Borneo. Standing on the coast, in the Baram district, 30 m. N.W. of Claudetown, it is the centre of an important oilfield and exports petroleum. Miri was in Japanese hands from Dec., 1941, to June 25, 1945.

Mirim OR MERIM. Lake of E. Uruguay and S. Brazil. It discharges its surplus water into the Lagoa dos Patos, on the Atlantic, and is separated from that ocean by salt lagoons. About 120 m. long, it varies in width from 5 to 25 m.

Mirror. Object with a smooth or polished reflecting surface—plane, convex, concave, or parabolic—for producing images of other objects, or for reflecting light and heat. Mirrors of polished bronze were used by the Egyptians, Greeks, and Romans. Praxiteles (c. 350 B.C.) suggested polished silver plates as the best reflecting surface. Glass was first used in Venice about 1300, first as a protective sheet to burnished silver plates, and then backed with mercury. A sheet of tinfoil was placed on the glass, and over this a coating of quicksilver, which formed an adhesive amalgam, protected by a coat of paint and varnish. Small mirrors were first made in England in 1615, when the industry was formed at Lambeth by Venetian craftsmen. About the time of Queen Anne they were made of heavy plate glass with bevelled edges.

The method introduced by Liebig in 1830, and still universally used, is to precipitate on glass an

ammoniacal solution of silver salt, to which tartaric acid and sugar candy are added, and finish with a protective coating of red lead, turpentine, and Japan gold size.

Mirzapur. District and town of the Uttar Union, India, in Benares div. Most of the dist. lies S. of the Ganges, and includes part of the Son valley and part of the N. face of the Deccan plateau. Rice, wheat, and millet are the chief crops. Only a quarter of the surface is cultivated. Area 4,322 sq. m. Pop. (1951) 1,017,289.

Mirzapur town, on the Ganges about midway between Allahabad and Benares, is a grain and cotton market, and makes shellac, lace, and woollen carpets. There are bathing ghats. Pop. (1951) 86,528.

Misanthrope, LE. A five-act comedy by Molière, produced at the Palais-Royal, Paris, June 4, 1666. Its slender plot concerns the unsuccessful suit of the misanthropic Alceste for the hand of the worldly minded but not wholly unlovable Célimène. While reflecting the essential barbarism of the court life of the period, it touches deep veins of human interest, and is usually regarded as Molière's greatest work, though not the most popular of his comedies. Alceste was acted by Molière; Célimène by his wife. *Le Misanthrope* provided the groundwork for Wycherley's *The Plain Dealer*, 1674.

Miscarriage. Expulsion of the foetus or immature offspring from the uterus before the end of the 28th week of pregnancy. After that date the term "premature labour" is used of a delivery before the full time.

Mischabel. Mountain mass of the Pennine Alps in the canton of Valais, Switzerland. It lies between Monte Rosa and Visp, and two of its peaks, the Dom and the

Taeschhorn, rise to 14,935 ft. and 14,758 ft. respectively. The Mischabel Joch is a pass between the Taeschhorn and the Alphubel, leading from Zermatt to Fee at an alt. of 12,650 ft.

Misdemeanour. In English law, a crime punishable on indictment which is not a felony. A felony is not necessarily more serious in itself than a misdemeanour: thus, larceny is a felony, while perjury is a misdemeanour. A conviction for a misdemeanour never involved forfeiture of land or goods, as a conviction for felony once did.

Miseno (anc. Misenum Promontorium). Volcanic peninsula of Italy in the prov. of Naples, forming the W. side of the Gulf of Pozzuoli, about 10 m. W. of Naples. It terminates in Cape Miseno and contains the village so named, which stands near the site of the ancient Misenum. Porto di Miseno, the fine natural harbour on the N., and that called Mare Morto on the N.E., were formed about 30 B.C. into a great naval station for the Roman fleet. Remains of moles, a theatre, and baths, etc., exist. Misenum was destroyed by the Saracens in 890.

Misérables, LES. Novel by Victor Hugo. Published 1862, it was designed as a novel with a purpose, presenting a series of moving scenes from the life of the poor; with a number of striking characters and many digressions. It has several times been made into a film.

Miserere. The Latin title and the first word of Psalm 51 (Eng. Have Mercy), one of the seven penitential psalms (in the Vulgate, Ps. 50). In the C. of E. it is said kneeling during the Litany.

Miserere, MISERICORD, OR PATIENCE. In ecclesiastical archi-



Miserere in Henry VII's Chapel, Westminster Abbey. The carving depicts the Judgment of Solomon; the left group represents the women contending over the live child; on the right is seen the mother of the dead child substituting her baby for the living one; in the centre is Solomon on his throne delivering judgement

ture, a hinged seat of a stall in church, which can be lifted and leant against the back of the stall. On its under side is a bracket which provides a higher rest for the occupant of the stall. This feature was introduced for the benefit of aged ecclesiastics who might be fatigued by long standing. The under-bracket is often finely carved.

Misericordia OR BROTHERS OF MERCY. Guild of laymen, founded at Florence in 1244 to provide decent burial for the poor. The brothers undertook the entire cost and arrangements of the funerals, themselves acting as bearers. They rendered valuable service during the Black Death in 1348-49; and they adopted a kind of monastic garb with a hood covering all the face except the eyes, lest they should be recognized and rewarded.

Mishmi. Aboriginal hill-tribe of the Brahmaputra valley, Assam. Numbering a few hundreds, they may represent an ancient offshoot from the Miao of S. China. They consist of four endogamous groups, each composed of patrilineal exogamous septs. Polygamy is practised; the dead are buried but by some are subsequently disinterred and burnt.

Mishna (Heb., teaching). Jewish code embodying the oral law, A collection of rabbinical teaching and interpretations of the Mosaic law, the Mishna was compiled and edited in its present form by Rabbi Jehudah el Nasi, c. A.D. 200. The Talmud (*q.v.*) consists of the Mishna and the Gemara (commentaries on the Mishna and the Mosaic law). The Mishna, first printed 1492, has been published in most modern languages spoken by Jews.

Misiones. Prov. of Argentina, between Paraguay and Brazil. It is watered by the Paraná and the Uruguay with their tributaries. Mainly hilly and forest-covered, Misiones produces maté, timber, tobacco, sugar, cereals, and fruits; cattle are reared. In the 17th century the Jesuits founded mission settlements in this region, peopled mainly by converted Indians. The chief town is Posadas on the Paraná. Area 11,749 sq. m. Pop. (1955) 327,578.

Miskolcz. Town of Hungary, on the Sajó on the edge of the Carpathian foothills, 116 m. N.E. of Budapest. The Calvinist church of S. Stephen dates from the 13th century, and there are R.C., Orthodox, and Lutheran churches. There is a considerable trade in wheat, wine, and cattle. Flour-

milling, pottery and porcelain making, and shoe-making are the main industries. Pop. (est. 1955) 136,000.

Turned into a strong point by the Germans during the Second Great War, Miskolcz was captured by the Russians after fierce fighting, Dec. 3, 1944, in the course of their advance on Budapest.

Mispickel. See Arsenopyrite.

Misprision (old Fr. *mes*, badly; late Lat. *prensio*, taking). Term originally meaning a mistake, in English law neglect of duty. The two chief kinds of misprision are misprision of treason and of felony. These offences are committed by knowing of treason or felony and concealing the same. If there is more than mere knowledge, *i.e.* if there is assent to the treason, the assentor is guilty of substantive treason; and if there is assent to the felony, he is liable as an accessory before or after the fact. In addition to misprision of treason and felony, certain offences in the nature of contempts and high misdemeanours rank as misprisings. If a secretary of state or other high executive officer is guilty of maladministration, as Strafford was, the articles of impeachment describe his offences as high crimes, misdemeanours, and misprisings. The term is also used to describe certain offences which rank as contempt of court, *e.g.* advising a witness not to give evidence.

Misrata. Coastal city of Libya, in Tripolitania. It consists of a large oasis, about 10 m. by 4 m., with 5,000 gardens, and is on the coastal caravan route to Homs and Tripoli.

Misrepresentation. In English law, a false statement of fact. A transaction, such as a sale induced by a misrepresentation of a material fact, is voidable, *i.e.* can be repudiated by the party deceived, if he repudiates it as soon as he discovers the falsity of the statement, and if it is possible to put the parties in the same position as before. No action will lie for damages for misrepresentation unless the statement was either made fraudulently, knowing its falsity, or was a warranty.

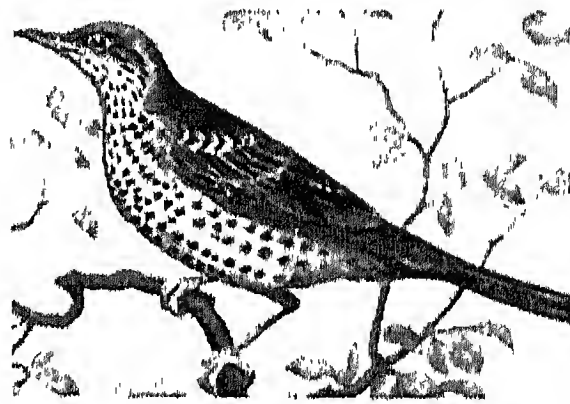
Missal OR MASS-BOOK. Office book of the R.C. Church. It contains the service for Mass throughout the year. Revised and printed 1570, after the council of Trent, 1545-63, had ordered its use in all

churches that could not claim uses of their own of 200 years' standing, it was again revised in 1604 and 1634. Of the nine service books used by the Church of England before the Reformation, the missal was in four parts: the antiphonary or gradual, containing parts to be sung by the choir at high mass; the lectionary, or book of the epistles; the evangelistarium, or book of the Gospels; and the sacramentary, containing the prayers. The first mention of a missal is found in the 8th century. A plenary missal for use of priests appeared in the 11th or 12th century. There are various missals for different rites or uses, Ambrosian, Sarum, Hereford, Lincoln, York, Bangor, etc.

Missel Thrush OR MISTLE THRUSH (*Turdus viscivorus*). Common British song-bird. Nearly related to the song thrush, but distinguished from it by its larger size, greyer colour, more prominent spots on the under parts, and the greyish white tips to the lateral tail feathers, it is the largest of the British song-birds and is widely distributed, though in the N. of Scotland it is rather rare. Its song is most notable in the winter, especially in wet weather, giving it its local name of stormcock. It nests in trees in the early spring, and two or even three broods are reared in the season. It feeds on worms, grubs, snails, insects, and the berries of many plants, particularly the mistletoe, whence its name. See Eggs, colour plate.

Missenden, GREAT AND LITTLE. Two parishes and villages of Bucks, England. They lie 9 m. S.E. of Aylesbury, having railway connexion with London. Missenden Abbey, at Great Missenden, dates in part from the 14th century, and contains a Norman font. Little Missenden centres upon an Elizabethan manor house.

Missile, MILITARY. In 20th-century military technology, a self-propelled aerial device carrying either a nuclear or a conventional explosive warhead. Propulsion may be by solid or liquid-fuel rocket (see Rocket), or by ramjet motor (see Jet Propulsion). There are two distinct types of self-propelled missile: the guided missile, which is controlled during flight to its target; and the long-range intercontinental ballistic



Missel Thrush, a common song-bird of the British hedgerows

missile, which follows a pre-set course and cannot change direction in flight.

Guided missiles developed from the German Evian and Wasserfall A.A. weapons of the Second Great War. These were powered by rocket motors and guided to their targets by radio control. The warhead was exploded by radio-proximity fuse.

There are four main types of guided missile: (1) surface-to-surface (SSM), fired from the ground against a land target, or from a ship against another ship or a land target; (2) surface-to-air (SAM), fired from the ground or a ship against aircraft; (3) air-to-air (AAM), fired by an aircraft against another aircraft; (4) air-to-surface (ASM), fired from an aircraft against a land or marine target. Air-to-air missiles are powered by solid-propellant rocket motors, whereas surface-to-air guided missiles can be powered by a ramjet with rocket-assisted take-off.

Missiles are guided to their target either by radar command or by beam riding. With radar command, two ground radar stations are used: one is "locked-on" to the oncoming target, *i.e.* follows it automatically on a radar screen; the other station has a screen which shows a continuous picture or moving "blip" of the missile launched to intercept the target. Both radar receivers are electronically linked to a computer-predictor which works out, according to the information fed into it, the course the missile must follow if it is to meet the target. The necessary course is then transmitted by radio to the missile, and variations in the radio impulses actuate the missile's control surface to set it on the required course.

In beam riding, a ground radar station picks up the target and then transmits a beam along which the missile travels. At the same time radio impulses actuate the missile's controls to bring it into range of the target. The movements of both target and missile are tracked on a radar screen.

When a guided missile has been brought within range of its target it is then "homed" against it by a secondary guidance system. Homing devices may be active, semi-active, or passive. In active homing, radar impulses from a small transmitter in the nose of the missile are reflected back from the target to the missile, which contains a receiver and guidance system to steer the missile towards

the source of the signals reflected from the target. In semi-active homing, ground radar transmits in the direction of the target and the impulses reflected from the target are picked up by a receiver on the missile which actuates its controls to steer it towards the target. In passive homing, the missile carries a receiver responsive to a source of energy radiated from the target. The energy may be in the form of heat (infra-red) radiation emitted by the target's engines; or it may be the noise, air disturbance, static electricity, or any other of the several kinds of energy radiation produced by an aircraft in flight. Any such radiated energy is picked up by a receiver on the missile and electronically converted into mechanical energy to operate the missile's controls and so draw it towards the target. Some guided missiles rely on contact with the target to detonate their warheads, but most missiles are fitted with radio proximity fuses.

Long-range Ballistic Missiles

Ballistic or unguided missiles are very large rockets which are launched on a course that will bring them on to a stationary target. They have a range of up to 6,000 m., but after launching they cannot be controlled from the ground. Once they have taken up their pre-set course they are maintained on it by automatic astro-navigation devices carried by the missile.

Unguided missiles travel high in the stratosphere and most of their propulsive power is expended in gaining altitude. The greater part of their journey to a target is by coasting in a great arc. They fall free on the target and explode on impact. During flight a ballistic missile transmits to its launching site radio signals giving a constant record of its speed and direction.

Mission, CHRISTIAN. Christianity has from the outset been a missionary religion. From Christ Himself is the commission to go "into the world and make disciples of all the nations." Christianity began with Judaism. The Acts of the Apostles contains the account of the opening of the door to the Gentiles, first to the Samaritans, regarded as half-Jews in blood and in religion; then to the Ethiopian eunuch and the Roman centurion, both probably adherents of the synagogue; finally at Antioch, where they "spoke unto the Greeks also." It was from Antioch that the mission to the Gentiles

fully began. S. Paul, Apostle of the Gentiles, did most to save Christianity from settling down as a sect within Judaism and to bring it to its fulfilment as a world religion.

Missionary expansion in the early centuries was helped by Roman communications, Greek language, and not least by the widespread dispersion of the Jews, whose influence provided in many a city a nucleus of monotheistic religion awaiting the Christian missionary. Before the year 200 Tertullian could speak of "places of the Britons, unreached by the Romans, but subject to the law of Christ." About the same time, an eastern writer, Bardaisan, claimed that there were Christians in Bactria. Before 300 there is evidence of missions as far E. as India. By 313 in the West, under the emperor Constantine, Christianity was becoming the state religion of the Roman empire. Later missionary activity may be divided into four periods.

(i) 500-1100: THE DARK AGES. The church survived the Western Roman empire, and began to convert the barbarians who had destroyed it: the Franks, 496, the Anglo-Saxons, 597, Germany, from the 8th century, Scandinavia and the Magyars of Hungary, 11th century. About the same time as these last victories of Latin Christianity, the Greek Church entered Russia. An adventurous mission from the church in Persia brought Christianity to China by 635, where it remained precariously till about 900. East and west, the monk was the medieval missionary. In this missionary work Englishmen early played a leading part: Willibrord, the first of note, went to the Netherlands c. 690; a little later Boniface of Crediton, in Devon, won the name Apostle of Germany.

(ii) 1100-1350: THE CRUSADES. The Crusades represent the answer of Christendom to that power which had caused the first setback to Christianity's missionary progress, Islam. It was the friars who came to see what a truly Christian campaign against the infidel should be. The two great orders, Franciscans and Dominicans, officially recognized their missionary duty in the same year, 1221. The greater glory belongs to the Franciscans. S. Francis himself preached before the sultan of Egypt in 1219. Raymond Lull died a martyr's death in Tunis, 1315. John of Montecorvino, first missionary from the church of the

W. to E. Asia, 1294, established his cathedral in Peking. These heroic missions were on too small a scale for lasting effects.

(iii) 1500-1700: ROMAN CATHOLIC REVIVAL. With the Spaniard, Christianity reached S. America and the Philippines. With Portuguese trade, Christianity touched Africa S. of the Sahara; it was replanted around the Indian coast; for the first time it reached Burma,

MISSIONARY SOCIETIES FORMED 1700-1840

<i>British</i>	<i>American</i>
1701 Society for the Propagation of the Gospel	1810 American Board
1792 Baptist	1814 Baptist
1795 London Missionary Society	1816 Bible Society
1796 Edinburgh and Glasgow Societies	1819 Methodist Episcopal
1799 Church Missionary Society	1835 Episcopal
1799 Religious Tract Society	1835 Dutch Reformed
1804 British and Foreign Bible Society	1837 Presbyterian
1809 Bible Society of Scotland	1838 Lutheran
1813 Methodist	
1825 Church of Scotland	<i>Continental</i>
1840 Irish Presbyterian	1797 Netherlands
1840 Welsh Presbyterian	1815 Basel
	1821 Danish
	1822 Paris Evangelical
	1824 Berlin
	1828 Rhenish
	1836 Leipzig
	1836 North German

Malaya, the E. Indies, Indo-China, and Japan; it came, for the third time, and to stay, to China. Greatest among the pioneers was S. Francis Xavier, who died on the threshold of China's closed door in 1552. That door was opened at last by the learning of other Jesuit missionaries, most notably Matteo Ricci, who won the respect of Chinese officials and emperor.

John Eliot, a Cambridge Puritan, went to N. America in 1631, and began work among the Red Indians. The (Anglican) Society for Promoting Christian Knowledge, and the Society for the Propagation of the Gospel in Foreign Parts, were founded in 1698 and 1701 respectively; the (Presbyterian) Society in Scotland for Propagating Christian Knowledge in 1709. The first and third of these were founded primarily to meet home needs, but all made some beginnings at foreign missionary work. The German Protestant, Ziegenbalg, 1705, under Danish patronage, founded a mission at Tranquebar. The Moravians in 1732 began missionary work in the W. Indies and Greenland. Methodists from England were at work among slaves in the W. Indies by 1786.

(iv) FROM 1792. In 1792, the year usually taken to mark the missionary awakening, the Baptist missionary society was formed.

In the next fifty years there followed all the main Protestant societies not only of the British Isles, but of the mainland of Europe, and of the New World. Protestant missionaries have translated the Bible, wholly or in part, into 1,120 languages. In the same period, missionary zeal among Roman Catholics revived, and today there are Christians in virtually every land: nominal Christians in Africa S. of the Sahara have been estimated as 7 p.c. of the population, in India about 2 p.c., in Asia (apart from the Philippines) 1 p.c.

The influence of Christians is out of all proportion to their numbers. Among some more primitive peoples Christianity has succeeded to the position of the community religion, and as such has begun to do for them what the church in the Middle Ages did for Europe.

In more complex civilizations Christianity has often contributed to the combating of social evils, and to the starting of new movements of idealism and aspiration. In China Christian missionaries started many schools and colleges—merged in state education after the Communist revolution of the 1940s. In India Christian schools and colleges were numerous (*e.g.* Protestant colleges numbered about 40), owing to government grant-in-aid, a system which began in 1854 and lasted till India achieved self-government in 1947. In Africa, under colonial government, something like 70 p.c. of education was under Christian influences, with medical and social work receiving subsidies also.

The Christian significance of medical missions is that they provide a demonstration of the Gospel. They have also in many lands created the new professions of doctor and nurse, and given Christian ideals to influence their standards. Christian leper homes supplied the largest field for experiments which have led to the hopeful treatment of leprosy; and, again in many lands, Christians have been responsible for attacks on illiteracy.

Though Christianity's strength of resources is still in western lands it is not a western but demonstrably, a world religion. The pope, in announcing the appoint-

ment of 32 new cardinals in 1946, said, "We have willed that the greatest possible number of races and peoples should be represented, as a true reflection of the universality of the Church." The same thing can be seen when 320 bishops of the Anglican communion gather at Lambeth from the four corners of the globe; or when there is a meeting of the council of Reformed and Presbyterian churches, the Methodist ecumenical conference, the Baptist world alliance, the international Congregational council, or the Lutheran world convention. Some of these bodies used to think of themselves as national churches; others repudiated all state connexion and were content to be small sects saved out of the world. All have grown to world-wide proportions. The Edinburgh missionary conference of 1910 marked the beginning of the international missionary council, chief agent of non-Roman missionary cooperation; from that time there began that still wider mutual consultation, the ecumenical movement, which in 1948 resulted in the world council of churches, including every main tradition except the Roman Catholic. *Consult* History of Christian Missions in India, Julius Richter, 1898; History of Christian Missions in China, K. S. Latourette, 1929; History of the Expansion of Christianity, K. S. Latourette, 7 vols., 1947; The Planting of Christianity in Africa, C. P. Groves, 1948; also International Review of Missions, quarterly 1912 onwards.

Mississippi. River of the U.S.A. It rises in Little Elk Lake, but Lake Itasca, Minnesota, 1,680 ft. alt., is generally regarded as its source. In its earlier course, marked by rapids and beautiful falls, it winds through a swampy country and forms many lakes. At Minneapolis, the head of navigation for large ships, are the Falls of St. Anthony, where the river makes a descent of 80 ft. in half a mile. Nearly 80 m. below St. Paul it expands into the large and picturesque Pepin Lake on the Wisconsin border. At Rock Island are rapids with a fall of 21 ft.

The Mississippi enters the Gulf of Mexico through many "bayous," the chief being the Atchafalaya and the Lafourche. It is about 2,330 m. long, and with its longest tributary, the Missouri, it is often accounted the longest river in the world; omitting the delta "passes" and old meanders, it may be shorter than the Amazon. At its junction

with the Missouri its breadth is 5,000 ft., and below New Orleans 2,475 ft. It receives many large tributaries, the more important being the Minnesota, Des Moines, Missouri, Arkansas, and Red from the W., and the Wisconsin, Illinois, Ohio, and Big Black from the E. Among important towns on its banks are Minneapolis, St. Paul, Dubuque, Moline, Rock Island, Burlington, Quincy, St. Louis, Memphis, Vicksburg, New Orleans.

The waters of the Mississippi have a gradual swell, which begins in Feb. and continues till June. They occasionally overflow the embankments and inundate the entire lower valley. The area originally subject to inundation was nearly 30,000 sq. m., but it has been largely reduced by a system of embankments (levees). The construction of these levees was begun early in the 18th century, and in 1916 the system, on which more than £27,000,000 has been expended, comprised about 1,500 m. About 95 m. below New Orleans the river divides into several outlets, the principal being the S.W. Pass, the S. Pass, and the N. Pass. By means of jetties, known as Eads jetties after the designer, the navigability of the lower river has been considerably improved. These jetties, extending E. and W. of the S. Pass and measuring $4\frac{1}{2}$ m., have enabled a channel of 30 ft. to be obtained, thus greatly adding to the importance of New Orleans as a port.

Flood Damage and Control

In April, 1927, a terrible disaster was caused by floods on the Mississippi and its tributaries, including the Arkansas. These rivers overflowed their banks to a depth of ten, and sometimes 20 feet, and covered over 1,000,000 acres of the most productive land in the United States. For three months the river was 100 miles wide at Greenville. New Orleans was only saved by blasting great gaps in the Poydras embankment. Relief measures were organized by Herbert Hoover, who estimated the loss at £80,000,000. About 600,000 persons were rendered homeless or dependent on charity. In June, 1936, the Flood Control Act established a definite flood control policy which provided for federal participation in the construction of economically justified projects in cooperation with states or other local interests. For the improvement of the river system, which comprises some 15,000 miles of inland waterways and enables steamers to travel from the Gulf of



Mississippi. Map showing the river basin. Inset, the delta on the Gulf of Mexico

Mexico to the Great Lakes, an expenditure of over £280,000,000 was made in 1937, the construction of 14 flood-control reservoirs in the Muskingum Valley, Ohio, being among the many improvements undertaken. Levees (*q.v.*) have been built from Rock Island, Illinois, to near Head of Passes, Louisiana, 484 m. above to 1,070 m. below Cairo. The Fort Peck dam and reservoir have improved navigation on the river and contribute to the control of flood water.

The river was first visited by a European in the 16th century, but nothing was known of it until 1673, when two Jesuits, Louis Joliet and Jacques Marquette, sailed down it as far as the mouth of the Arkansas. La Salle, in 1681-82, went down as far as the river mouth. At that time it flowed through soil claimed by France, and Frenchmen made a number of settlements on its banks. After the treaty of 1763 its course was the joint property of Great Britain and France. Spain secured the rights previously held by France, while the U.S.A., by the treaty of 1783, obtained the British ones; there was trouble between these two countries about the navigation, but this was ended when Louisiana was purchased by the U.S.A. in 1803. In the 19th century the U.S.A. conducted a thorough survey of the river and its tributaries. See Bluff; Louisiana; River. Consult Discovery of the Mississippi, J. G. Shea, 1903; The Opening of the Mississippi, F. A. Ogg, 1904.

Mississippi. A state of the U.S.A. A south central state, it has a coast-line of 85 m. on that part of the Gulf of Mexico known as Mississippi Sound. Its area is 47,716 sq. m., of which 468 are water. The surface rarely exceeds 800 ft. in height, and falls away S. and W. to the rich alluvial lands of the Mississippi and Yazoo valleys. These are known as the bottom lands, and of them there are 7,000 sq. m. in the delta of the Yazoo. The chief rivers are the Mississippi, which bounds it on the W., Pearl, Tombigbee, Yazoo, and Pascagoula. The state includes a number of islands.

A great amount of cotton is grown, and much maize. Other cereals are cultivated, and cattle, sheep, and pigs are reared; the sugar-cane is grown, and much land is under fruit. Important petroleum sources were discovered in 1941. By 1948 these had become the state's most important source of wealth apart from cotton. Jackson is the capital. Of the pop. of 2,178,914 (1950) almost half were negroes. Generally negroes are debarred from voting by educational and other tests. In 1946 a crippled ex-service man invited negroes to vote in the primaries for the first time and won a congressional seat.

As part of Louisiana, Mississippi was first settled by French colonists, who made their homes in a land hitherto inhabited solely by Indian tribes. It passed to England in 1763, but in 1783 was formally ceded to Spain, that country

having taken possession of it in 1781. A dispute soon arose about the boundary between the U.S.A. and the soil of Spain, the result being a treaty by which the future state was included in the U.S.A. The Spaniards vacated it in 1798, when it was made a territory.

In 1817 Mississippi was admitted to the Union as a state. A constitution was drawn up in that year, but the existing one dates from 1890. The state legislature consists of a senate and a house of representatives, both elected for four years. The state sends two senators and six representatives to congress.

Mississippian. In geology, a group of limestone rocks well developed in the Mississippi Basin, U.S.A. Of Lower Carboniferous age, they roughly correspond to the Carboniferous Limestones of the U.K. See Carboniferous System.

Mississippi Scheme. Financial enterprise devised with the object of restoring the shaken credit of France. In 1715, when Philip of Orleans became regent, the finances of France were in an appalling condition; national bankruptcy was almost inevitable. It was then that John Law persuaded Orleans to approve his scheme and started a bank in France.

With this for a basis, Law acquired the sole right to trade in the vast region around the Mississippi which he called Louisiana, and in 1717 he founded a company for this purpose. Having turned his bank into a national institution with the guarantee of the state behind its notes, Law planned a much bigger concern. Two other trading companies were amalgamated with his, and under him a new *Compagnie des Indes* dominated practically the whole of France's foreign trade. With the issuing of new capital for its activities the gamble began. The shares rose rapidly in value, while the company purchased the right to manage the mint and to farm much of the national revenue. Finally the national debt was taken over, the lenders receiving shares in the company to which the government paid interest at 3 p.c. New shares were issued at a large premium, and in 1719 were selling at forty times their face value.

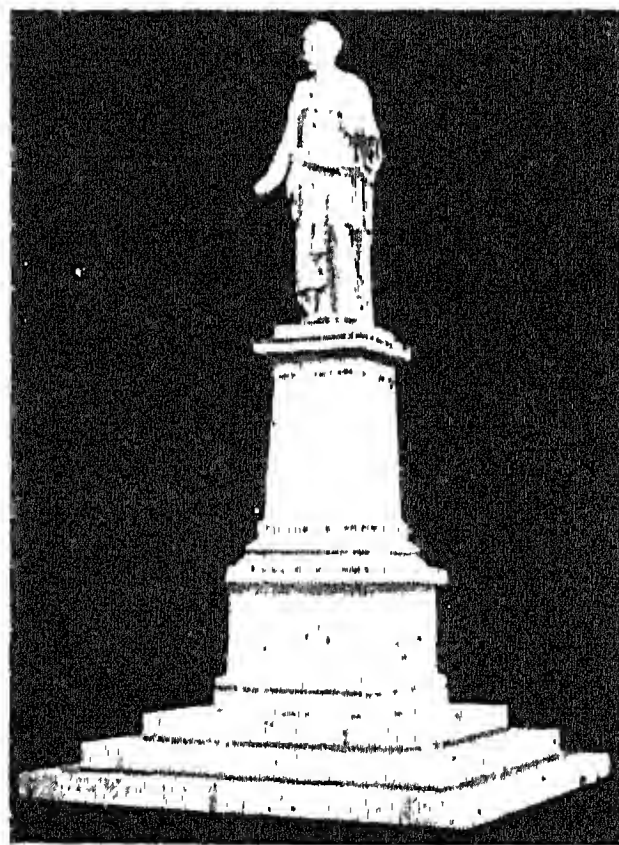
Armed with absolute power, Law took strong measures to avert a collapse, but his edicts, fixing the price of the shares, and in other ways striving to perpetuate an artificial state of affairs, failed miserably of their purpose. By July, 1720, the bubble had burst.

The government took back the national debt, but speculators had suffered huge losses. See Law, John.

Mississippi Sound. Channel between the coast of Alabama and Mississippi states, U.S.A., and several narrow islands which cut it off from the Gulf of Mexico. About 70 m. long, with a mean breadth of 8 m., it extends from Lake Borgne to Mobile Bay, and is navigable by coasting vessels.

Missive (Lat. *missus*, sent). In Scots law, a letter exchanged between two parties, in which the one specifies and the other accepts the terms and conditions of an offer of purchase or sale, or other mutual transaction. A missive constitutes a legal contract.

Missolonghi, MESOLONGHI, OR MESOLONGION. Town of Greece. Situated on a swampy plain N. of the Gulf of Patras, and about 20 m. N.W. of Patras, it is the capital of the dept. of Aetolia and Acarnania. It has a trade in currants,



Missolonghi, Greece. Byron's statue, erected in 1881 over the mound in which his heart was buried

valonia, and local products. The town was formerly of some military importance, being besieged unsuccessfully by the Turks in 1821-22 and in 1825-26 during the Greek War of Independence. Byron died here on April 19, 1824. Pop. 9,270.

Missoula. City of Montana, U.S.A., the co. seat of Missoula co. It stands on the Missoula river, 125 m. W.N.W. of Helena, and is served by the Northern Pacific and the Chicago, Milwaukee and Puget Sound rlys. It contains the state university. The Northern Pacific Rly. has workshops here, and lumber milling is carried on. Missoula was founded in 1864 and received a city charter in 1887. At Jumbo Mountain, E. of the

town, an extensive series of horizontal markings represents shore lines of the former glacial lake Missoula. The town still has a frontier atmosphere; as late as 1935 Redskins camped near by. Pop. (1950) 22,485.

Missouri. River of the U.S.A. The longest tributary of the Mississippi river, it is formed by the junction of the Madison, Jefferson, and Gallatin rivers, which have their sources in the Rocky Mountains and unite at Gallatin City in Montana. Thence it flows N. and N.E. through a mountainous district and traverses a deep cañon called the Gates of the Rocky Mountains, the river here being compressed to 450 ft. for about 6 m. At Great Falls it makes a descent of 350 ft. in about 16 m., passing over a series of cataracts of much grandeur, the highest of which has a vertical drop of 90 ft. Below Fort Benton it turns E., passes through N. and S. Dakota in a S.E. direction, forms the boundary between Iowa and Missouri on the E. and Kansas and Nebraska on the W., and finally takes an E. course across Missouri to join the Mississippi 20 m. above St. Louis.

Measured from the source of the Jefferson its length is 2,950 m., while from Gallatin City to the Mississippi it is 2,466 m. Near the Grand Falls its breadth is 1,500 ft., at Sioux City 2,500 ft., and at its entrance to the Mississippi about 3,000 ft. It has several large tributaries, the principal being the Milk and Yellowstone in Montana, the James and White in South Dakota, the Nebraska or Platte in Nebraska, and the Kansas in Kansas. It drains a basin with an area of nearly 600,000 sq. m., and is navigable during part of the year to Great Falls, but in the low water season only to its confluence with the Yellowstone, its largest affluent. On its banks are many important towns, including Omaha, Atchison, Leavenworth, Kansas City, and Jefferson City. Its waters are turbid, which gives rise to its name, meaning mud river. Fort Peck dam and reservoir in Montana were completed in 1940. The dam was part of a scheme for improving navigation on the river, for controlling floods, and providing hydro-electric power. It is 250 ft. high, with a volume of 128,000,000 cu. yds. The reservoir has an area of 383 sq. m. and holds 6,326,000 million gallons.

Missouri. Central state of the U.S.A. Its area is 69,674 sq. m., of which nearly 450 are covered with

water. It is bisected by the Missouri river, which also forms the upper part of the W. boundary; the Mississippi marks the E. frontier. S. of the Missouri the surface is relieved by the forest-clothed Ozark Mts., the N. portion consisting of prairie and bottom lands, wooded only in part. An agricultural state, it yields rich crops of maize, wheat, oats, potatoes, cotton, tobacco, and flax. Stock-raising is carried on.

Missouri is the largest zinc-and lead-producing state of the Union, has more than 14,000 sq. m. of coalfields in operation, and a considerable output of iron ore and other minerals. Slaughtering and meat-packing, flour-milling, and boot and shoe making are among the many valuable industries. There are a state and other universities, besides numerous colleges, and, in addition to the rivers, transport facilities include 6,882 miles of steam and 263 miles of electric railways. Two liberal newspapers, the St. Louis Post-Dispatch and the Kansas City Star, have national influence.

The state capital is Jefferson City, but Missouri contains three larger cities, St. Louis, Kansas City, and St. Joseph. Other cities are Joplin, Springfield, Sedalia, Hannibal, Webb City, and Carthage. The 1950 pop. was 3,954,653, with many of German descent, and only a few negroes.

Missouri was part of Louisiana, and as such was settled by the French. In 1762 it was transferred to Spain, and in 1803 the large district of which the future state formed part was sold to the U.S.A. In 1812 Missouri was made a territory, and in 1821 was admitted to the Union as a state. It is a border state, and gave 118,000 troops to the S. army and 116,000 to the N. army in the Civil War. It is governed by a general assembly which consists of a senate, elected for four years, and a house of representatives, elected for two. The franchise requires a short residential qualification. Politically, it preserves a balance between Republican elements representing the urban well-to-do and Democratic ones, representing small-town interests and those of the workers in the cities. It sends two senators and 11 representatives to congress. Consult History of Missouri, P. S. Ruder, 1927.

Missouri Compromise. Arrangement made in 1820 by which the territory of Missouri was ad-

mitted as a state of the American Union. The state constitution submitted by Missouri recognized slavery, a fact which aroused a vehement agitation against it in the Northern states, and caused a two-years' deadlock in congress, the senate supporting and the house of representatives opposing the application. Ultimately an agreement was attained by which slavery was prohibited in the whole of the Louisiana Purchase N. of lat. 36° 30', except that part of it forming the territory of Missouri, nearly all of which lay to the N. of that line. The repeal of this arrangement in 1854 led to the formation of the Republican party and precipitated the Civil War. Missouri was admitted to the Union Aug. 10, 1821.

Mist. Cloud of minute particles of water at ground level. Meteorologically the distinction between mist and fog is one of degree, the latter term being applied when visibility is less than 1 km. and mist when it is greater than this but less than 2 km. After a clear, cold night, mist frequently fills the valleys; in rainy weather mist enshrouds the hill tops, though none may be present in the valleys.

Mistake. In English law, an error of fact which entitles the party who has paid money under the mistake to recover it, or a party who has entered into a transaction to have it set aside. A mistake of law cannot be pleaded, nor will anyone be allowed to say that he was mistaken as to the meaning of the words in a contract. Where there has been a mutual mistake in the drawing up of a contract or conveyance, so that it expresses something which the parties had not really agreed, the court has jurisdiction to rectify the document so as to cause it to express the real intention of the parties.

Mistassini. Lake in the extreme N. of Quebec, Canada, drained by the Rupert river. Small islands divide it down the centre into practically two sheets of water. Length 100 m., breadth 15 to 20 m., depth 300 to 400 ft.

Mister. English masculine title of respect, abbreviated in writing to Mr. A variant of master, it is



Misti. View of the Peruvian volcano, showing the city of Arequipa in the foreground

used as a prefix in speaking in a ceremonious way of anyone, and sometimes in addressing a man in speech or writing. In its present sense it has been used since the 15th century or thereabouts, when it supplanted master. It is also used as a prefix to certain titles of office, e.g. Mr. Speaker. The feminine is mistress (*q.v.*). The French equivalent is monsieur, the German is herr, and the Spanish señor.

Misti, EL. Volcanic mt. of Peru in the prov. of Arequipa. It is situated a few miles N.E. of the city of Arequipa, and has a height of 20,000 ft.

Mistinguett. Stage name of Jeanne Bourgeois (1869–1956), French actress, who made her stage début at a Paris music-hall, appearing during 1899–1907 at the Gaîté Rochecrouart, where she enjoyed a sensational success as



Mistinguett.
French actress

singer and dancer. After several seasons in revue at the Moulin Rouge (of which she was for many years part-proprietor) and the Bouffes-Parisiens, she was partnered by Maurice Chevalier (*q.v.*) at the Casino de Paris and the Folies-Bergère in the years before and after the First Great War. The songs she introduced were immensely popular in Paris during the 1920s. Her only appearance in London was at the Casino Theatre, 1947. She died near Paris, Jan. 5, 1956. Consult Mistinguett and her Confessions, 1938.

Mistletoe (*Viscum album*). An evergreen semi-parasitic shrub of the family Loranthaceae. Native of Europe and North Asia, its stems vary in length from a foot to four ft., and are yellowish-green in colour. The leathery leaves are of the same colour, and are oval-lance-shaped, mostly in pairs. The

small green flowers are unisexual, and consist of four sepals, with four stamens, or an ovary with simple stigma. The berries are white, a third of an inch in diameter, with a single seed invested by glutinous pulp. Birds distribute the seeds, either by swallowing and evacuating them or by wiping them off their beaks on to the branch of a tree. On germination the embryo pierces the bark and penetrates to the wood. It draws most of its food from the tree, but manufactures carbohydrates in its leaves. Its host plants are very numerous, the chief being black poplar and apple in England and the plains of France; but in Dauphiné and the Rhine valley it is most abundant on Scots pine. American mistletoe, of which there are several species, forms a distinct genus.

The mistletoe is prominent in European folk-lore as a magical plant credited with many virtues, from giving the power to see ghosts to healing diseases. See Balder; Druid; Golden Bough.

Mistral. Piercingly cold, dry wind experienced chiefly in winter along the Rhône valley and the coasts of the Lion gulf. A depression over the Mediterranean, accompanied by anti-clockwise circulation of the air, brings down heavy cold air from the central plateau of France as a N.W. wind, and causes a hot sirocco to blow from the African coasts northward. The mistral, characterised by clear skies and bright sunshine, sometimes develops great violence: in the Rhône valley velocities of 90 m.p.h. have been recorded.

Mistral, Frédéric (1830-1914). French poet who wrote in the Provençal language. He was born Sept. 8, 1830, at Maillane, Bouches-du-Rhône. His rustic epic, *Mirèio*, 1859, gave wide recognition to the movement for reviving the Provençal language and literature. It was followed by other notable works, also in Provençal: *Calendau*, part legendary, part allegorical, 1867; and *Lis Isclo d'Or* (the golden isles), a collection of short poems, 1875. Later works were *Nerto*, a



Frédéric Mistral,
French author



Mistletoe. Sprays of leaves
and berries

light romantic tale in verse, 1884; *Lou Pouëmo d'ou Rouse*, an epic of the Rhône, 1897; *Moun Espelido*, 1906, translated into English as *Memoirs of Mistral*, C. E. Maud, 1907. In 1904 Mistral received half of the Nobel prize for literature, and devoted it to the purchase of a palace at Arles in which to house the Félibrean Museum. He died March 25, 1914. Consult *Mistral*, C. A. Downer, 1901; *Bibliographie Mistrallienne*, E. Lefèvre, 1903.

Mistral, Gabriela. Pen-name of Lucila Godoy-y-Alcayaga (1889-1957). Chilean poet. Born April 7, 1889, at Viña del Mar, Chile. she became a teacher. Director of the Magallanes elementary school, in southern Chile, she was later appointed to the consular service, representing her country at Madrid, Lisbon, Rio de Janeiro, Petropolis (Brazil), and Los Angeles. She was professor of history of Spanish civilization at Barnard College, New York, 1931, and secretary of the League of Nations institute for intellectual cooperation before the Second Great War. She died in New York after a long illness, Jan. 10, 1957.

Her literary reputation was established abroad with *Desolación*, 1922, a collection of prose and verse, though her earlier work, such as *La Voz de Elqui*, 1908, was well known in S. America. Her other collections included *Lecturas para Mujeres*, 1923; *Nubes Blancas*, 1923, and *Tala*, 1938. She was awarded the Nobel prize for literature in 1945. Much of her poetry shows affinity with Buddhist thought.

Misurata. Town of Libya, in Tripolitania, N. Africa, on a bay some 110 m. E. of Tripoli. Built around a large oasis, it produces dates. During the First Great War it was the capital of the ephemeral republic of Tripolitania under the Arab bandit Ramadan Secteui. During the Second it was occupied on Jan. 18, 1943, by the British 8th army in their final advance. It is the chief town in a district of the same name, pop. (1954) 66,735.



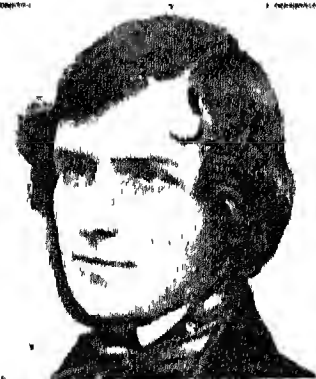
Gabriela Mistral,
Chilean poet

Mitanni. Name of an ancient Oriental state created in the 2nd millennium B.C. by the Hurrians in N. Mesopotamia. Its capital was probably Washshukanni on the upper Khabur, near mod. Ras el 'Ain. Knowledge of its history and civilization are incomplete; the names of eight kings reigning during c. 1500-1350 B.C. are known from cuneiform sources and from Egyptian mentions of the country MTN or NHRN, Naharina or Naharain. Mitanni controlled Assyria for a time, and successfully opposed the efforts of Thothmes III of Egypt to cross the Euphrates, where the boundary of Egyptian control was set by treaty ratified by a royal marriage. Thereafter relations between the two powers were friendly, as the letters of King Dushratta to Amenhotep III and IV show. Encroachment westwards by Shutarna II was countered by the Hittites, who c. 1350 annexed the kingdom and set a Hittite nominee on the Mitannian throne.

Mitau. German name for the Latvian town of Jelgava (*q.v.*).

Mitcham. Borough of Surrey, England. It is on the Wandle, 10 m. S. of London, and has main line rly. and London Transport services. It gives its name to a bor. constituency. SS. Peter and Paul is the original parish church; other churches are Christ Church, S. Mark's, S. Barnabas's, S. Olave's, and the Church of the Ascension. Mitcham Common, 480 acres, was one of the earliest homes of golf in England, and the village green has long been famous for cricketers. The industries include light engineering, the manufacture of paints and varnishes and fireworks, and the preparation of confectionery and food products. Mitcham was long famous for lavender, used in making perfume. The charter fair held annually from ancient times was held on the old green for the last time in 1923. Pop. (1951) 67,269.

Mitchel, John (1815-75). British journalist and politician. Born in co. Londonderry, Nov. 3, 1815, the son of a Presbyterian minister, and educated at Trinity College, Dublin, he was prosecuted in 1848 for writing seditious articles in *The United Irishman*, and was sentenced to transportation for 14 years. Escaping from Van Diemen's Land, he made his way in



John Mitchel,
Irish nationalist

1853 to America, where he became a prominent advocate of slaveholding and the Southern cause. In 1875, while still in America, he was elected member for Tipperary. His right to take his seat was denied on the ground of his conviction for treason felony, but the electors returned him a second time. Mitchell returned from America to contest the point, but died at Dromalane, March 20.

Mitchell. Peak of the Black Mts., in N. Carolina, U.S.A. Known also as Mitchell's Peak and Black Dome, it is 6,711 ft. in alt., the highest summit of the U.S.A. east of the Rocky Mts. See Appalachians.

Mitchell. Type of American bomber, also employed by the R.A.F. in the Second Great War. Designed by the North American co., and known to the U.S. army as the B-25, it was named after Gen. William Mitchell (1879-1936), a protagonist of the bomber in modern warfare. As a heavily armed high-speed medium bomber, the Mitchell was successfully used in every theatre of war. It had two 1,700 h.p. Wright Cyclone engines, affording a maximum speed of 275 m.p.h., with full bomb load of 3,000 lb. The crew numbered five. See Aeroplane illus. p. 131.

Mitchell, ABE (1887-1947). English golfer, born at East Grinstead. He reached the semi-final of the amateur championship in 1910, and played for England against Scotland in 1910-11-12. Having been runner-up in the amateur championship of 1912, he turned professional, and won the gold medal at the Daily Mail and the News of the World tournaments in 1919. He played for Great Britain against the U.S.A. in Ryder Cup matches, 1921, 1929, 1931, 1933. He died June 11, 1947.

Mitchell, CHARLES (1861-1918). British boxer. Born in Birmingham, he defeated Bob Cunningham in a knuckle fight there early in 1878. In 1882 he won the middleweight and heavyweight championships of England, and soon visited America, where he gained several notable victories but was defeated by John L. Sullivan. He again fought the latter, at Chantilly in 1888, with bare knuckles, the contest resulting in a draw after 39 rounds. Mitchell challenged Jim Corbett, American world champion, but was defeated after three rounds, at Jacksonville, 1894. He died April 2, 1918.

Mitchell, JOHN THOMAS WHITEHEAD (1828-95). British business

man. Born at Rochdale, Oct. 18, 1828, he began to work in a cotton mill as a child of 10, and, having obtained some education in his leisure, joined the Rochdale Pioneers cooperative society. He started the Rochdale system of profit-sharing, and became a director of the Cooperative Wholesale Society in 1869 and its chairman in 1874. Mitchell, who was almost entirely responsible for the development of the enterprise, died March 16, 1895. *Consult* Life, P. Redfern, 1923.

Mitchell, SIR PETER CHALMERS (1864-1945). A British zoologist. Born at Dunfermline, Nov. 23, 1864, and educated at Aberdeen, Oxford, Berlin, and Leipzig, he was university demonstrator of comparative anatomy at Oxford before becoming secretary of the Zoological



Sir Peter Chalmers Mitchell, British zoologist

Society in 1903, and F.R.S., 1906. Under his direction many improvements were made in the London Zoological Gardens. Knighted in 1929, he resigned five years later and was succeeded by Julian Huxley. His writings include *The Childhood of Animals*, 1912; *Materialism and Vitalism in Biology*, 1930; *My Fill of Days*, 1937; *Mv House in Malaya*, 1938. He died July 2, 1945.

Mitchell, REGINALD JOHN (1895-1937). British aircraft designer. Born at Stoke-upon-Trent, he served his engineering apprenticeship and in 1916 joined the Supermarine Aviation Works (Vickers), becoming chief engineer and designer in 1920. In 1927 he became a director of the company and was awarded the silver medal of the Royal Aeronautical Society for his winning seaplane in the Schneider trophy contest. For his work on the S6B, which won the trophy outright for Great Britain in 1931, he was created C.B.E. Mitchell also designed the military flying boats Southampton, Scapa, and Stranraer, and the amphibious Seagull and Walrus. His Spitfire (*q.v.*) fighter, based on experience with Schneider trophy machines, first flew in 1936, going into service with the R.A.F. in 1938. Mitchell died June 11, 1937, the world's greatest aircraft designer. In a film, *The First of the Few*, 1942, Leslie Howard portrayed Mitchell.

Mitchell, SILAS WEIR (1829-1914). American neurologist and author. Born in Philadelphia, Feb.



S. Weir Mitchell, American neurologist

15, 1829, and educated at Jefferson medical college there, he inaugurated the Weir-Mitchell treatment for neurasthenia, hysteria, etc., substituting massage, rest, and isolation for the exercise previously advocated. His treatment became famous, and he was president of the Association of American Physicians, 1887, and of the American Neurological Association, 1908-09. Among his scientific books are *Injuries to Nerves and their Consequences*, 1864; *Rest in the Treatment of Disease*, 1875; *Clinical Lessons on Nervous Diseases*, 1895. Weir Mitchell was a prolific writer of children's books, among which is *The Wonderful Stories of Fuz-buz, the Fly, and Mother Grabem, the Spider*, 1867; and novels, *e.g.* *Roland Blake*, 1884; *John Sherwood, Ironmaster*, 1911. He died Jan. 4, 1914. See *Weir Mitchell Treatment*.

Mitchison, NAOMI MARGARET (b. 1897). A Scottish novelist. Daughter of J. S. Haldane (*q.v.*), she was born in Edinburgh, Nov. 1, 1897, and went to the Dragon School, Oxford. She wrote vivid novels and stories dealing with the ancient world or mythological themes, like *Cloud Cuckoo Land*, 1925; *The Corn King and the Spring Queen*, 1931; *The Delicate Fire*, 1933. A more urgent note was sounded in *The Moral Basis of Politics*, 1938; *The Blood of the Martyrs*, 1939.

Mite. Small creature belonging to the class Arachnida and order Acarina. Most mites are very



Itch mite, highly magnified

small, and some resemble miniature spiders. They have no "waist," the thorax and abdomen being fused together, and the latter entirely unsegmented. Many are parasitic and do considerable damage, some being the cause or vehicle of serious disease. Thus the diseases known as itch and mange (*qq.v.*) are caused by mites that attack the skin. Another species, commonly known as

the harvest bug, bores, during its larval stage, into the human skin, causing great irritation. A red mite is a parasitic pest of poultry and cage birds. Another mite, commonly called red spider, invades hop gardens and does much damage in greenhouses by sucking the juices of plants. A wormlike mite of the genus *Demodex* inhabits the sebaceous follicles of the human skin. Others infest cheese, flour, etc.

Mitford, MARY RUSSELL (1787-1855). British writer. She was born at Alresford, Hants, Dec. 16, 1787, the daughter of a doctor, whose extravagances kept her poor all her life. Her tragedies, *Julian*, 1823; *The Foscari*, 1826; *Rienzi*, 1828; *Charles I*, 1834, enjoyed contemporary success; but her fame rests on sketches of country life and character, contributed in the first instance to *The Lady's Magazine*, 1824-1832, and republished as *Our Village*. She died at Swallowfield, near Reading, Jan. 10, 1855. *Consult* Life, V. Watson, 1949; Elizabeth Barrett to Miss Mitford (letters), ed. B. Miller, 1954.



Miss Mitford,
British writer

Mitford, NANCY. See under Baron Redesdale.

Mithradates VI OR MITHRADATES (131-63 B.C.). King of Pontus. On the murder of his father, Mithradates V, 120 B.C., he became king, and on reaching man's estate extended his conquests to the Crimea and parts of Armenia. Ordered by the Romans to give up Cappadocia, which he had annexed, he defeated all efforts to oust him, and eventually overran the whole of the Roman province of Asia, where 80,000 Roman citizens were put to death by his orders. In 87 B.C. Sulla arrived in Greece, into which

Mithradates had thrown an army, and signally defeated the king at Chaeronea and Orchomenos in 86; another Roman army under Fimbria defeated him in Asia, and he concluded



Mithradates VI
King of Pontus
From a coin

peace. Fighting began again in 83 and 82 B.C., but was not of long

duration. The third Mithradatic War began in 74, and lasted till 63. Lucillus, the Roman general in command, was at first successful, driving Mithradates from Pontus and defeating also his brother-in-law, Tigranes, king of Armenia, with whom Mithradates had taken refuge, but he penetrated too far into Mesopotamian Armenia, and was compelled to return. The war was brought to an end by Pompey, whose army drove Mithradates into the Crimea, where, at his request, a Gallic attendant put an end to his life.

Mithras OR MITHRA. Ancient Iranian god whose cult spread from Persia into the Hellenistic world after the death of Alexander but did not become important in the Roman Empire until the late first century A.D. when Mithraic communities, founded by soldiers, traders, and slaves from the eastern provinces, appeared in Rome, in Italy, and on the northern frontiers.

Mithras was an angel of light in the Zoroastrian hierarchy, but by the time his religion spread to the west he had become the Unconquered Sun, the mediator between gods and men, and the instrument whom the Supreme Being had chosen in the beginning of things to slay the great bull from the life-blood and spinal-cord of which came all life upon the earth: vegetation, the beasts, and mankind.

Mithraism promised eternal life to the believer. It had its own theology which satisfied the minds of the educated and the hearts of the ordinary worshipper. A place was found in its system for all natural phenomena, for the pagan deities, and for the astrological beliefs common in all sections of society. The Supreme Deity, Eternal Time (Saturnus), was shown as a lion-headed god wreathed about with a serpent. From him sprang the Sun, the Earth, and the Olympic gods. Mithras, born miraculously from a rock, had rescued the Sun from the powers of evil and set him back again in the heavens, and he and the Sun came to be regarded as one and the same.

The temples (*mithraea*) were oblong buildings, half underground, symbolic of the sacred cave where Mithras had slain the bull. Across the cult end they regularly had a sculptured group showing the god, in Persian costume, plunging his knife into the animal. On either side of the nave were wide benches; there was a

vestibule where initiates underwent some of their ordeals. Worshipers were admitted to full participation in the rites by a series of seven initiations, the successive orders being the Raven, Occult, Soldier, Lion, Persian, Runner of the Sun, and the Father. The Fathers were the seniors, the priests of the conventicle. Initiates above the Lion order were admitted to a sacred banquet in which bread and wine were consumed.

One of the weaknesses of Mithraism seems to have been the small part which women were allowed to play, but this deficiency was early made good by an alliance between Mithraism and the worship of the Great Earth Mother, Cybele, who had been brought to Rome from Asia Minor in 212 B.C. The cult of Cybele brought into Mithraism the fashion of performing *taurobolia* and *criobolia*, sacrifices of bulls and rams, the blood from which was made to fall through a grating on to the votary in a trench below. Supported by the pagan emperors, Mithraism was the most important rival of Christianity. It was suppressed when pagan worship was prohibited in A.D. 392.

Several fine *mithraea* have been found in Rome and Ostia; many others are known. The worship of the god flourished on the Roman Wall in Britain and also in the City of London, where, in Walbrook on the site of Bucklersbury House, the remains of a temple and some of its statuary came to light in 1954.

Mitla OR MICTLAN (place of the dead). Site 30 m. E. of Oaxaca, Mexico, in the district of Tlaxiaco. Within a mountain-girt valley are five groups of ancient buildings, built by the Mixtecs in the 14th and perhaps early 15th centuries. They consist of paved courts surrounded on three sides by low rectangular buildings of dressed stone adorned with bands of geometrical reliefs executed in stone mosaic. Two of them have large rock-cut tombs beneath. See Mixtec.

Mitosis. In biology, process of nuclear division. It involves the longitudinal splitting of each constituent chromosome into two equal parts and the separation of these parts for the production of two new nuclei equivalent in every way to the original.

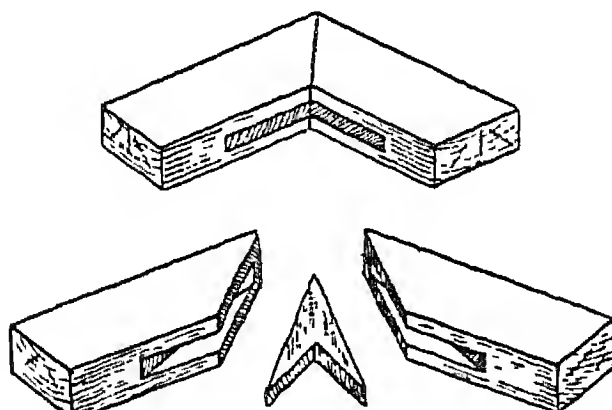
Mitrailleuse (Fr. *mitraille*, grape shot). French name for the machine-gun in general. The original Montigny mitrailleuse was

taken up by the French in 1869 and introduced in the army for the Franco-Prussian War, 1870-71. See Machine-Gun.

Mitral Valve. Valve which lies between the left auricle and the left ventricle of the heart. It is so called from the likeness to a bishop's mitre of two flaps which form it. When the heart muscle is in systole, *i.e.* contracting, the valve opens and blood passes from auricle into ventricle. When the heart muscle is in diastole, *i.e.* relaxing, the valve closes and prevents the back flow of blood from ventricle into auricle. With local inflammation, associated with acute rheumatism, this valve may become narrowed and incompetent, the blood finding its way backwards during diastole. This condition, known as mitral-stenosis, tends to be progressive, and is serious. See Heart.

Mitre. Head-dress of bishops and certain abbots of the Western Church, and occasionally of other ecclesiastics. The Jewish high priests wore a tall form of head-dress, called *mitra* in the Septuagint, but it is denied that the mitre was an adaptation of this. In its early forms, the mitre, which came into use about the 10th century, was low and simple. In the 14th century it increased to a foot or more in height. In the Church of England mitres fell into gradual disuse after the Reformation, disappearing in the 18th century, but were revived by some Anglican bishops after 1885. The English

right angle, of two similar blocks or mouldings, the meeting ends being equally bevelled. In some



Mitre. Thick inside key for mitre joint. Above, assembled. Lower, in sections

ancient Greek structures, the mitre was not carried straight through the entire joint, but was deflected, thus making the joining half mitre and half butt-joint. With double blocks the mitring was generally done on the inner blocks, the outer forming a butt-joint. See Joinery.

Mitre, BARTOLOMÉ (1821-1906). Argentine soldier, president, and man of letters. Born at Buenos Aires, June 26, 1821, he began his public life as journalist in 1838 at Montevideo. Leaving Uruguay for Bolivia, he became chief of the staff to the president, on whose fall



Bartolomé Mitre, Argentine statesman

he was exiled and went to Peru, thence to Chile, where he became noted as a journalist, and for attacks on the government was again exiled.

In 1852 Mitre returned to Argentina, and having taken part in the successful revolt against Rosas when Buenos Aires became an independent province, he was successively commander-in-chief of its army, minister of war, and minister of government and foreign relations. In 1862 he was elected president of the confederation for six years. Against Paraguay, 1865-70, he commanded Argentine, Brazilian, and Uruguayan troops. Founder of *La Nación*, he was author of *Historia de Belgrano y de la Independencia Argentina*, 1859, and *Historia de San Martín y de la Emancipación Sud-Americana*, 1889-90. Never successful again as a presidential candidate, he died Jan. 18, 1906.

Mitsubishi (Jap., three diamonds). Japanese industrial trust, so called from the device on the flag of the steamship company which was its earliest enterprise.

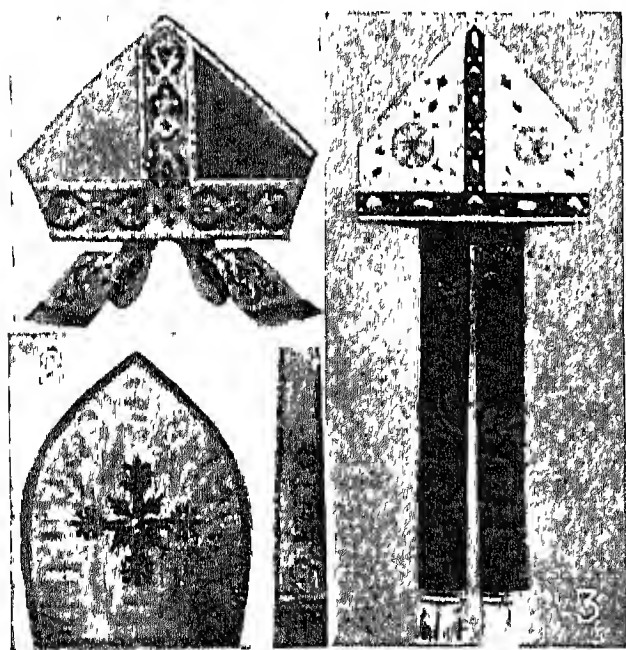
Under the direction of Iwasaki, the trust came to the fore in the second half of the 19th century, when the law against the operation of ocean-going ships was repealed. In 1874 the government granted the Mitsubishi Steamship Co. a subsidy and transferred to its ownership some 60 ships bought abroad by the government for the Formosa expedition. In 1885 the line was amalgamated with the Union Transport Co. to form the Nippon Yusen Kaisha (Japanese Mail Steamship Co.) In 1946, when the trust was dissolved by order of the Americans, the Mitsubishi interests included banking, shipbuilding (with dockyards at Nagasaki), manufacturing (including motors and aircraft), real estate, and insurance, and the total capital of the 38 corporations was 2,767 million yen.

Mitsui. Oldest of the *Zaibatsu* or great industrial trusts of Japan. It was founded in 1632 in Yedo (Tokyo), where the Mitsui family carried on business as *hake-ya*—agents who realized for the feudal overlords the tributes paid to them in kind, and managed their financial affairs, on a commission basis. The Mitsui trust embraced 91 corporations with an aggregate capital of 3,880 million yen; its activities included banking, international trade, manufacturing, mining, heavy industry, and paper and flour mills. It was liquidated in 1946 by order of the U.S. authorities.

Mittelland Kanal. Name of a German waterway described under Midland Canal.

Mitylene, MYTILENE, OR LESBOS. Island in the Aegean Sea, belonging to Greece. Lying S. of the Gulf of Adramyti (Edremid) and Asiatic Turkey, it covers 675 sq. m. It is mountainous, with two excellent harbours, the soil is fertile, and corn, olives, and vines are extensively cultivated. About 1100 B.C. it was occupied by Aeolian immigrants, and five centuries later, under its "tyrant" Pittacus, it became the centre of the civilization of the Aeolians of Asia Minor. Greek lyrical poetry arose in Lesbos, the birthplace of Alcaeus, Terpander, Sappho, and Erinna. Its most important towns were Mitylene and Methymna.

Mitylene was successively in the hands of Persians, Athenians, Mithradates, and the Romans. After the defeat of the Persians, it joined the Athenian naval league, but, having revolted, its territory was distributed among Athenian settlers. In the time of Alexander



Mitre. 1. Gothic. 2. Roman, with bands detached; two forms used in R.C. Church. 3. Anglican mitre

By courtesy of Burns, Oates and Washbourne, and A. R. Mowbray & Co., Ltd.

form is smaller than that worn by bishops of the R.C. Church. The mitre of bishops of the Greek Church is a dome-shaped crown. See Tiara.

Mitre. In building and joinery, the line formed by the intersection or juncture, generally at a

it suffered severely from the Macedonians, and later from the Romans, as a punishment for having supported Mithradates. It was rebuilt by Pompey, soon recovered much of its prosperity, and was especially favoured by Tiberias and Nerva. In the 14th century the East Roman emperor, John Palaeologus, bestowed it upon a Genoese nobleman, by whose descendants it was held until its conquest by the Turks in 1462. In 1913 it was restored to Greece. In the Second Great War German troops occupied Mitylene without opposition on May 5, 1941, holding it until Sept., 1944. Pop. (1951) island, 154,795; town, 25,518. *Pron.* mitti-leeni.

Mivart, ST. GEORGE JACKSON (1827-1900). British scientist. He was born Nov. 30, 1827, and educated at Harrow, afterwards studying at King's College, London. After joining the R.C. Church he was called to the bar, but devoted himself to science and in 1862 became lecturer on anatomy at St. Mary's Hospital. In 1869 he was made F.R.S., and he was secretary of the Linnean Society, 1874-80. For three years he was a professor at Louvain. Writings on zoology brought him into touch with Darwin and Huxley. He did not wholly accept the Darwinian theory of evolution, yet certain articles led to his excommunication. He died April 1, 1900. Among his writings may be mentioned: *On the Genesis of Species*, 1871; *Man and Apes*, 1873; *The Cat*, 1881; *Nature and Thought*, 1882; *The Origin of Human Reason*, 1889; *Birds*, 1892.

Mix, TOM (1881-1940). American film actor. Born of mixed stock (including Celtic and Cherokee Indian), on a ranch at El Paso, Tex., Jan. 6, 1881, he was educated at Virginia military academy, and served as an army surgeon in the Spanish-American



Tom Mix,
American film actor

War. He was the star of many early "Western" pictures, in which he was always an adventurous cowboy, with his marvellously trained horse Tony. His first talking film, *Destry Rides Again*, was in 1932, but after appearing in *Rough Riding Romeo* he gave up the screen for the circus. He was killed in a car accident in Arizona, Oct. 12, 1940.



Mitylene, Aegean Sea. The town of Mitylene, on the east coast of the island, seen from the roadstead

Mixtec. An American Indian people, linguistically akin to the Zapotec, in Oaxaca, Guerrero, and Puebla, Mexico. They number some 150,000, and are descended from an ancient people of Oaxaca who displaced the Zapotecs from part of their territory including Monte Albán about 1300. Notable potters and goldsmiths, they greatly influenced Aztec culture. The Aztecs overran their country in 1495. *See also* Mitla.

Mixture. In chemistry, a term used to imply that the ingredients of a composition retain their individual properties. Sulphur and iron filings can be mixed without any chemical combination taking place; but if heated, the iron and sulphur combine chemically, and a new substance, iron sulphide, is formed, which possesses the characteristics of neither ingredient. The term mixture in pharmacy is applied to liquid medicines which either contain insoluble substances in suspension, or are composed of two or more liquids, with or without other matters in solution.

Miyajima. Sacred island of Japan in Hiroshima Bay, an arm of the Inland Sea. The island, also called Itsukushima, is counted as one of the three most celebrated sights in Japan, on account of its scenery and temples; it is 5 m. by 2½ m., and culminates in Misen, 1,800 ft. Miyajima town, pop. 4,000, on the N.W. coast, is connected by steam ferry with Miyajima station in Honshu, on the main line between Kobe and Shimonoseki. The temples were known in the 9th century, restored in the 12th century, and destroyed by fire and rebuilt several times since. About 40,000 pilgrims visit the island annually in normal times.

Miyazu. Town of Japan, in Honshu. Situated on Miyazu Bay, an arm of Wakasa Bay, on the N. coast, almost due N. of Osaka, it is a small port with trade in beans from the N.E. provs. of China. The neighbouring pine groves of Amanohashidate are one of the famous sights of Japan. Pop. 10,000.

Mizar. Double star. Called alternatively Zeta Ursae Majoris, it

is composed of a star of the second magnitude with a fourth-magnitude companion 14 seconds of arc away. The components revolve round each other in 20 days 14 hours. They cannot be separated except in a telescope.

Mizo. *See* Lushai Hills.

Mizpah OR MIZPEH (Heb. a watch-tower). Ancient name of (1) The high place, unidentified, where Jacob and Laban formed a compact (Gen. 31). (2) A region at the foot of Mt. Hermon (Josh. 11), probably near the Druse village of Mutelle. (3) Mizpeh of Gilead, the home of Jephthah. (4) A town fortified by Asa, and chosen as his residence by Gedaliah, governor of Jerusalem, after its capture, 586 B.C. It has been identified with Nebi Samwil, a mt. 2,935 ft. in alt., 4 m. N.W. of Jerusalem. It owes its present name (prophet Samuel) to a Muslim tradition which makes it the burial-place of Samuel (cf. 1 Sam. 7), and its mosque, formerly a Crusaders' church, contains a cenotaph revered as his tomb. The mt. was stormed by British troops in the First Great War, Nov. 21, 1917.

Mizzen Mast. In three-masted ships, the after mast. When there are four masts, all large, the after one is still called the mizzen, but if this last is small the masts are styled foremast, main mast, mizzen, and jigger.

Mnemonics (Gr. *mnemonikē*, art of memory). The art of improving the memory, especially by artificial aids and methods. Nearly all such methods depend upon the association of ideas, and they are chiefly based upon the principles of localisation and analogy. The former, topology, associates what is to be learnt with the picture of a building or place well known to the learner; the latter establishes an analogy between things or words and some familiar object.

Technical verses perhaps quite meaningless (like the Barbara, Celarent of the logicians), and the substitution for numbers of letters of the alphabet (1 t, 2 = n), which are made up into words and phrases, form another kind of aid. The art of memory is of very

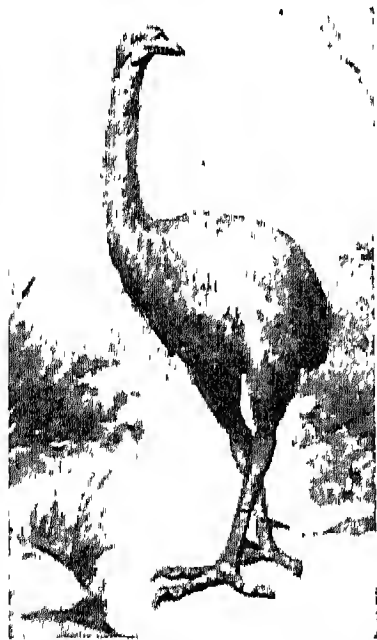
ancient date, and was regularly cultivated in the Greco-Roman schools. The Greek poet Simonides, 6th century B.C., employed the topological method. In the Middle Ages Raymond Lully's Great Art was similarly arranged.

Attention is now directed rather to the psychological side of the question as likely to suggest means for the improvement of the memory. Purely mechanical systems are prejudicial to more scientific methods, although they may be usefully applied to lists of names and dates, and even to the learning of foreign words, by inserting an intermediate link in the shape of a word or words, recalling by association the two extremes. See Memory Training. *Pron.* neemonnics.

Mnemosynē. In Greek mythology, daughter of Uranus, and the personification of memory. By Zeus she was mother of the Muses.

Moa. Maori name for the *Dinornis*, a genus of extinct flightless birds, which formerly inhabited New Zealand. About 20 species have been identified from their remains, the largest standing nearly 12 ft. high, the smallest being about the size of a turkey. They had apparently disappeared when European colonists arrived in New Zealand, but the state of

preservation of the eggs, feathers, and bones, which are found in abundance in Holocene deposits, suggests that the birds had not long become extinct. They were unable to fly, but their long and powerful legs indicate that



Moa. Reconstruction of extinct wingless bird of New Zealand

they could run with great speed. They had rounded, loosely constructed feathers, and their eggs were pale green.

Moab. Territory occupied in ancient times by the Moabites. It is an elevated tableland E. of the Dead Sea and lower Jordan valley, extending eastward to the Arabian desert. The river Arnon and other rivers flow westward through deep valleys. See Dead Sea; Palestine.

Moabites. An ancient Semitic people, closely related to the Hebrews. According to Gen. 19, they were descended from Moab, incest-

uously begotten by Lot. They were frequently at war with Israel and Judah, and were conquered by David. Ruth was a Moabitess. Solomon took Moabite wives, and introduced the worship of their national god Chemosh (*q.v.*) into Jerusalem. The Moabites recovered their independence, and Mesha, who set up the Moabite stone, won victories over Israel. Moab disappeared after the Babylonian conquest. See Palestine.

Moabite Stone. Black basalt slab from Dibon, Moab; discovered by Klein in 1868. International competition led to its



Moabite Stone. Ancient record of Moab's battles with Israel, dating from c. 850 B.C.

being shattered by its Beduin custodians. It was recovered for the Louvre, Paris, and its reconstruction was aided by paper squeezes secured by Clermont-Ganneau, covering 34 lines of primitive Hebrew script in the Moabite dialect of about 850 B.C. This inscription narrates Israel's conflict with Mesha.

Moat. Large trench round a fortified place for defensive purposes. The term is derived from the French *motte*, meaning an embankment and, in Norman-French, the ditch formed by the excavation necessary for providing the soil for such an embankment. Medieval castles were frequently provided with two moats, often filled with water, an inner one encircling the keep and an outer the precincts. By means of a moat the height of a battlement was considerably increased. See Bodiam Castle; Castle; Keep.

Moawiya. Caliph of Damascus 661-680, and founder of the Om-miad dynasty. Governor of Syria, he revolted against the caliph Ali, and after the murder of the latter

was proclaimed his successor. The dynasty lasted until 750.

Mobile. Bay and river of Alabama, U.S.A. The bay is formed by the Alabama and Tombigbee, which, after receiving the drainage of most of the state of Alabama, unite to flow S. to the Gulf of Mexico through an extensive delta of gum and cypress swamps. The Mobile is the W. and the Tensaw the E. of the five main distributaries which reach Mobile Bay, itself a part of the delta. Mobile river is 38 m. long: the bay is 27 m. long and 8 m. wide and less than 70 ft. deep. Mobile City is at the mouth of the river in the N.W. of the bay.

Mobile. City and seaport of Alabama, U.S.A., the co. seat of Mobile co. It is 135 m. E.N.E. of New Orleans, and is served by rlys. Its prominent buildings include the city hall, Battle House, and city and U.S. marine hospitals. The seat of a bishop, it has a fine Gothic cathedral and several educational institutions. Cotton, timber, resin, flour, cereals, coal, cotton-seed oil, and provisions are exported, and coffee, tropical fruits, asphalt, sisal grass, and potash imported.

Industries include saw-milling, shipbuilding, and the manufacture of cotton, veneers, and machine-shop products. There are important fisheries. Large harbour and dock improvements have been undertaken, and the port is visited by steamers from Europe, New York, Cuba, and South America. The original city was founded in 1702 by the French, the present city, farther S., being built nine years later. In 1704 the governor instituted the annual Mardi Gras festival which ends on Shrove Tuesday. Mobile was the capital of the French colony of Louisiana; was British, 1763-80; and Spanish, 1780-1813. It received a city charter in 1819, and was rechartered in 1887. Pop. (1950) 129,009.

Mobilisation (Lat. *mobilis*, movable). Process of bringing a navy, army, or air force to operational strength for war. In modern usage, the term includes organization of industry and industrial manpower to maintain and supply the fighting services; putting into operation civil defence measures; establishing economic and monetary controls; taking over by the government of sea, land, and air transport; and commandeering goods and services essential to military operations.

British mobilisation for the First Great War was carried out by

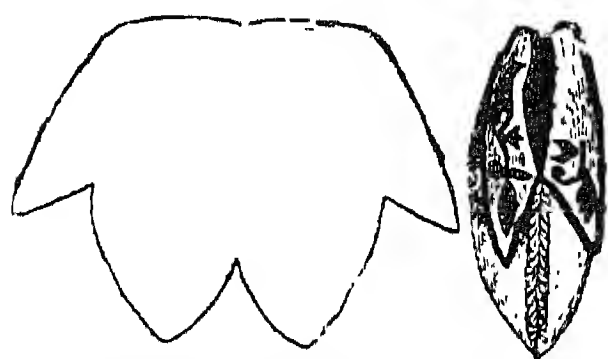
proclamation, the first day of mobilisation for the navy being Aug. 4, and for the army Aug. 5. Having retained reservists and ships called up previously for manoeuvres, the navy was in fact ready for active service by Aug. 3. The army completed its calling up of reservists and the issue of equipment from store by Aug. 10, and the British Expeditionary Force was ready to leave for France two days later.

General mobilisation of the Royal Navy for the Second Great War was ordered at 4.38 p.m. on Aug. 29, 1939, and completed on Aug. 31. Naval forces in home waters had been in a state of instant readiness for war since June 15, when reservists had been called up and the reserve fleet fully manned for exercises; on Aug. 23 the Admiralty had assumed control of all movements of merchant shipping. The general mobilisation of the army was ordered on Sept. 1; advance parties moved to France on Sept. 4; and one corps began to disembark on Sept. 10. Mobilisation of the R.A.F. was authorised on Sept. 1, and by Sept. 3 all stations were on a war footing. Civil defence services were mobilised and the black-out imposed on Sept. 1. There were no specific dates for the Axis powers' mobilisation, as they had been on a war basis, industrially and militarily, for at least 12 months.

At the time of the Munich Crisis (*q.v.*) the A.A. and coastal defence units of the Territorial army, the Observer Corps, and defensive units of the Auxiliary Air Force were called up on Sept. 26, and released Oct. 5, 1938. Mobilisation of the fleet took place Sept. 28, and was relaxed by stages.

In 1859, France required 37 days to mobilise 130,000 men and transport them to Italy; Prussia took 17 days to mobilise 400,000 and transport them to the French frontier in 1870; and in 1899 Great Britain occupied 13 days mobilising and embarking 40,000 men for South Africa.

Moccasin, OR MOCASSIN. Shoe worn by the N. American Indians.

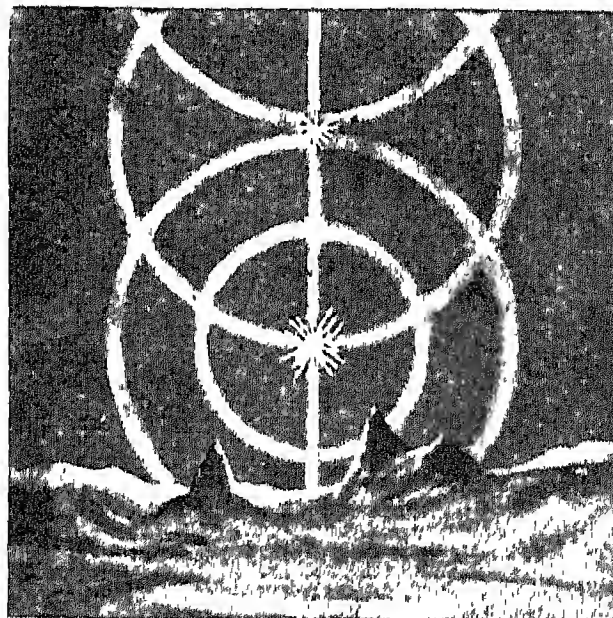


Moccasin. Pattern and made-up moccasin of one piece

Moccasins are made of soft deer skin, sometimes with raw hide soles added, but materials vary slightly in different parts of the country. The uppers are often embroidered with beadwork or decorated with porcupine quills, etc. See Boot and Shoe, colour plate.

Moccasin (*Natrix*). Name given to harmless snakes found in N. America and also in the Old World. They are usually called water snakes, and should not be confused with the poisonous water moccasin (*Ancistrodon*).

Mocha OR MOKHA. Port in the Yemen, S.W. Arabia. About 60 m. N.N.W. of Cape Bab-el-Mandeb, it was formerly the centre of an immense trade in coffee, but a great part of its business has been transferred to Hodeida, farther up the coast of the Red Sea.



Mock Sun. Pictorial diagram showing halos round the sun and mock suns at their intersections

Mock Heroic Poetry. Verse written in burlesque of the heroic in action or character. It deals with the general, parody being concerned with the particular. The earliest example is that of The Battle of the Frogs and Mice, at one time supposed to be by Homer, but probably rather intended as a burlesque of his Iliad. Chaucer's Story of Sir Thopas, in The Canterbury Tales, was written in mockery of the romances of the time. Beaumont and Fletcher in The Knight of the Burning Pestle dealt in stage mock heroics with the old romances, to which Cervantes at the same time was giving a death blow in Don Quixote. Butler's Hudibras, Dryden's Macfleeknoe, and Pope's Dunciad are satires in mock heroic form. The Rehearsal, by Buckingham and others, and The Critic, by Sheridan, depend for their fun on the mock

heroic elements in them. Boileau's Le Lutrin was imitated and far surpassed by Pope in The Rape of the Lock, one of the wittiest examples of the mock heroic in English. See Poetry.

Mocking Bird (*Mimus polyglottus*). Common bird of N. America, nearly related to the thrush, which it much resembles



Mocking Bird. Cuban specimen of this N. American bird

in appearance. It gains its name from the facility with which it imitates the notes of other birds. It is found in the U.S.A. and the W. Indies, and is characterised by long tail, short wings, and whiteness of the underpart of the body. The wings and

tail are black, marked with white, and the bird, including tail, measures a little less than a foot. See Bird; Catbird.

Mock Suns and Moons. Optical phenomena often seen in conjunction with halos of the sun and moon. They are known meteorologically as parhelia and paraselenae respectively. Coloured or white images of the sun and moon appear on, or just outside, the ordinary halo ring, generally at the same elevation as the luminary. The images are due to the reflection and refraction of rays of light by ice crystals formed in the upper atmosphere. See Halo.

Mòd (Gael. from Old Norse, meeting or "moot"). Annual Gaelic festival. Meetings are held by An Comunn Gàidhealach, a society of Scottish Highlanders founded in 1891 to preserve and encourage the Gaelic language, music, etc., of Scotland. Competitions in singing, playing, etc., are held. The movement has spread so that local mòds are arranged independently. *Pron.* mode.

Modder. River of S. Africa. Rising near Dewetsdorp, about 40 m. S.E. of Bloemfontein, it flows N. and then W. through the Orange Free State, and entering Bechuanaland, discharges, after a course of 186 m., into the Vaal, near where the rly. crosses the latter on the way from Cape Town to Bulawayo.

The battle of Modder River on Nov. 28, 1899, was the third action fought by Lord Methuen in his attempt to relieve Kimberley. The British were surprised on the W. bank near Ritchie by Boers under de la Rey, and the advance held up until the Boer flank was turned by Gen. Pole-Carew. Methuen was badly wounded. The

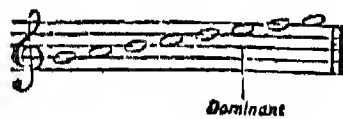
Boer casualties were about 150, the British losses being nearly 400. *See* South African War.

Mode. Musical term of varied meaning. The Greek modes, and the modes of the Middle Ages which remained in use until about the middle of the 17th century, were concerned with the order of the tones and semitones in the octave scale, *i.e.* with the mode or manner of their arrangement.

The modes chiefly in use may be remembered in a rough and ready way by thinking of the white keys only of the pianoforte. The Ionian mode began on C, and was thus identical with our modern major scale; the Dorian on D; the Phrygian on E; the Lydian on F, the Mixolydian on G; the Aeolian on A, like the present descending melodic minor scale; and the Locrian—little used and hardly recognized by authorities—on B. Each of these normal or authentic modes had a plagal scale related to it, running from dominant to dominant of the authentic scale. Thus the Ionian mode was:



with dominant at G. The plagal form, called Hypoionian, was:



with dominant at E. *See* Gregorian Chant.

Modelling. Fashioning an article in some plastic substance, either in the round or in relief. Potter's clay in a fairly liquid state is the principal material used. During the progress of the work the moisture is preserved by sprinkling with water, and at night by wrapping the model in a wet sheet, or in a bag that will prevent the air affecting it. In figure sculpture in the round, various supports for the model are required. For a bust, a single upright, with a crossbar to carry the shoulders, will suffice. For the full figure, an iron upright, the height of the figure, is the mainstay of other supports for the limbs; this is fixed in a circular plinth, constructed to revolve on a wooden boss, so that the model can be turned round without the sculptor shifting his ground. Most of the work is done with the fingers. *See* Bronze Statuary; Plaster Cast; *consult* Modelling and Sculpture, A. Toft, 1905.

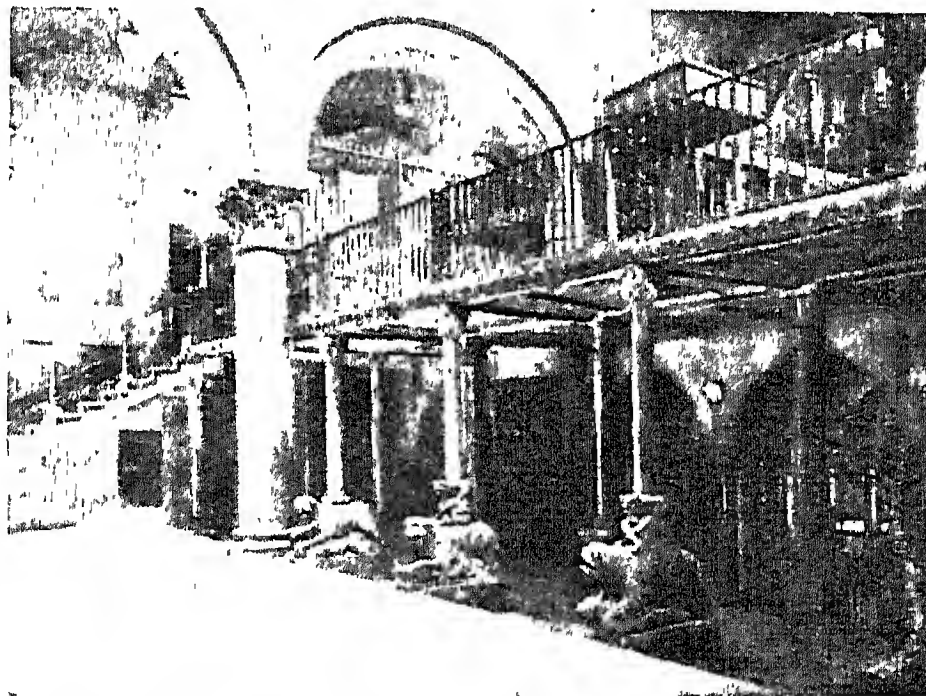
Model Parliament. Name given to the parliament summoned by Edward I in Nov., 1295. It consisted of the barons, two knights

from every shire, and two burgesses from every considerable borough, and also representatives of the lower clergy. It was given its name because it was the model on which later parliaments were called, being representative of the nobles, clergy, and commons.

Modena. Duchy of Italy. It dates from 1452, when the city and the district around it, which since 1288 had been in the possession of the Este family, was made a duchy for Borso d'Este. During the Napoleonic wars the duchy became part of the Cisalpine republic. In 1814 it was given to Ferdinand, a member of the Hapsburg family, who had married Maria Beatrice, the heiress of the house of Este, and he and his son reigned until the latter was driven out in 1859. *See* Este.

Modena. Prov. of N. Italy, in Emilia. It stretches N.E. from the Tuscan Apennines to the Po valley. It is mountainous in the S.W., but in the fertile tracts it produces wheat, wine, and hemp. Goats and sheep are reared. Area, 1,003 sq. m. Pop. (1951) 490,247.

Modena. City of Italy, the capital of the prov. of Modena. It stands in a low and fertile plain, be-



Modena, Italy. Crypt beneath the cathedral chancel, containing the tomb of S. Gemignano, the patron saint of the city

tween the Secchia and the Panaro, tributaries of the Po, and is 23 m. by rly. N.W. of Bologna, on the Aemilian Way. The splendid Romanesque cathedral, begun in 1099, has a lofty campanile and many curious carvings and statues. Other churches include S. Agostino with its memorials of the Este family. S. Pietro, S. Vincenzo, and others were damaged by air raids on May 13, 1944, and other occasions. The ducal palace (also hit), built early in the 17th century, is now used for public purposes. Among other buildings are the university, founded in 1683; a

library containing 140,000 vols. and several thousand MSS.; a town hall, dating in part from 1194; and museums and art galleries. There are several fine open spaces and recreation grounds. The manufactures include silks, woollens, linens, hats, and leather and iron ware, and there is trade in cattle, cereals, wine, fruit, and liqueurs. Pop. (1951) 111,094.

A Roman colony from 183 B.C., Modena, then called Mutina, was besieged by Mark Antony in 43 B.C. Sacked by the Huns under Attila in 452, it was afterwards taken by the Lombards. In the 11th century it was the property of the marchioness of Tuscany, afterwards being for a short time a free city. It was acquired by the Este family in 1288, and was the capital of the duchy ruled by them until the foundation of the kingdom of Italy. The British 8th army took Modena from the Germans on April 24, 1945.

Moderation. Term used in the Presbyterian Church to denote the act of moderating, *i.e.* calling a minister. When a congregation meets with the local presbytery, under the presidency of the moderator, for the purpose of signing the call to a minister-elect, the meeting is said to be a moderation. If the presbytery is satisfied that the congregation are unanimous, and that there is nothing against the personal character of the minister-elect, it grants a moderation to the people of that congregation to proceed with the call. *See* Presbyterianism.

Moderator

(*Lat. moderari*, to

control). Name given to various academic and ecclesiastical officials. At Oxford university moderators are the examiners at the first public examination for degrees, commonly called moderations, abbreviated to mods. At Cambridge they are university officers who superintend the examinations for the mathematical tripos. At Dublin they are the candidates for the degree of B.A. who take first and second place in honours, and are called senior and junior moderators respectively.

The word is applied especially to the presiding officers at meetings

and courts of the Presbyterian Church. Interim moderators are appointed by the local presbytery to fill a temporary vacancy in a church pending the appointment of a new minister. Moderators of local presbyteries hold office for a year, as also does the moderator of the General Assembly. In Scotland the Established Church, the United Free Church, and the Free Church each has its own moderator. Nine moderators were appointed in the Congregational Church of England and Wales from 1919, each appointed to a particular province; but they carry no authority over individual churches, their function consisting rather in influence, persuasion, and advice. See Presbyterianism; Church of Scotland; Congregationalism.

Modernism. Name given to a tendency of thought which came into prominence in the R.C. Church at the start of the 20th century and was condemned by Pius X in 1907. Modernism was made up of several elements; some were old and all were German. In religious philosophy modernists owed much to Kant and Schleiermacher; they were inclined to think that whether or not an historical event took place and was in that sense "true," it did not matter; what mattered was the practical consequences that came from believing it to be true. The "historical Jesus" might never have existed; the "Jesus of faith" was alone important, i.e. the experience of believing in Him. This idea was made fashionable by the popularity of pragmatism.

Since history could be bypassed in this way, modernists tended to take over the methods and spirit of German higher criticism of the Bible. This put all the emphasis on the "internal evidence" of books of the Bible, in which it was ready to find alleged contradictions and discrepancies. With such emphasis, almost inevitably criticism is controlled not by what the critic finds in his texts, but by what he brings to them as the assumptions of his arguments; and so Harnack, the greatest of all and a scholar, excluded many things simply because he believed that miracles could not happen, and naturally explained away any passage that reported them as having happened.

Similar criticism was performed by modernists on the history of dogma. They thought there could be in theology or religion no unchangeably true proposition, truth being rather in what a thing means

in the experience of a believer. This is what is meant by the claim of the modernists that Christian teaching was being brought by them into accord with the spirit of the age. (It follows that non-Christian religions, though perhaps incomplete, are just as "true" as the Christian; for what matters is the experience of their believers. Much, then, was made of comparative religion.)

From the R.C. Church, in which prominent modernists like Loisy and Tyrrell were excommunicated, the movement went deep into sections of the Church of England. The Modern Churchman represents what it there stood for. But now in the Church of England modernism is being repudiated and the philosophy behind it discredited; while its historical and critical methods are being rejected by greater accuracy and sounder scholarship. **John P. Boland**

Bibliography. Modernism: a Record and a Review, A. L. Lilley, 1908; Liberalism, Modernism, and Tradition, O. C. Quick, 1922; Father Tyrrell and the Modernist Movement, J. L. May, 1932; The Modernist Movement in the Roman Church, A. R. Vidler, 1934.

Modern Painters. Treatise on art by John Ruskin, published 1843-60. The work was begun as a defence of Turner's later manner, and gradually developed into a treatise on the principles of art, a rhapsody on the glories of nature, a panegyric on Tintoretto and the Florentine masters, and eventually a vehicle for conveying the author's views generally. The title was suggested by the publishers, Smith, Elder & Co., the author's own title having been Turner and the Ancients.

Modern School. Term used to denote a secondary school, i.e. for pupils aged 11 to 16, having a curriculum less academic than that of the traditional grammar school. Such schools were advocated in the report of the Hadow committee. Before the Education Act of 1944 most modern schools were administered under the regulations for elementary schools. In some areas they were called central schools; in others, selective central schools. A few had at least one group of pupils following an academic course in preparation for a certificate examination; but in most the curriculum was broader, and involved various types of arts and crafts, and group educational activities. See Secondary School.

Modica. Town of Sicily, in the prov. of Ragusa. It stands in the

Valdi Noto, 33 m. direct and 57 m. by rly. S.W. of Syracuse. The site of the Sicel city Motyea, it has remains of megalithic buildings. It trades in wine, olive oil, cattle, and fruit. Pop. (1951) 37,783.

Modification. A metallurgical phenomenon. It is of great value in the manufacture of light alloy components for aircraft. Aluminium alloys readily with silicon, and a group of alloys contains between 11 and 13 p.c. of the latter. If these alloys are cast normally, the metal has a coarse structure which makes it weak and liable to crack under shock. But if about 0.05 p.c. of sodium or of sodium fluoride be added to the molten alloy, the structure is found to be modified in the solid to a much finer grain, which makes the casting stronger and tougher. This alloy has application in cylinder blocks, crank-cases, and other parts of Diesel and internal combustion engines.

Modigliani, Amedeo (1884-1920). Italian painter. Of Jewish origin, he was born in Leghorn, July 12, 1884, and studied at Florence Academy and in Rome. In 1906 he settled in Paris, where in Montmartre he was influenced by negro sculpture. A drunkard and drug addict, he lived in penury, but his personality attracted such painters and writers as Derain, Utrillo, Vlaminck, and Cocteau. As a painter he did not exhibit until 1909, and he died Jan. 25, 1920. Sensitively observed, his portraits were notable for elongated proportions, restrained colour, and energetic grace. He is represented in Moscow, Detroit, London, and Zürich.

Modjeska, Helena (1844-1909). Polish actress. Born at Cracow, Oct. 12, 1844, the daughter of a musician, she married an impresario, G. S. Modrzejewski, in 1861, and after playing some years on tour, made her début at Cracow in 1865. In 1868 she married



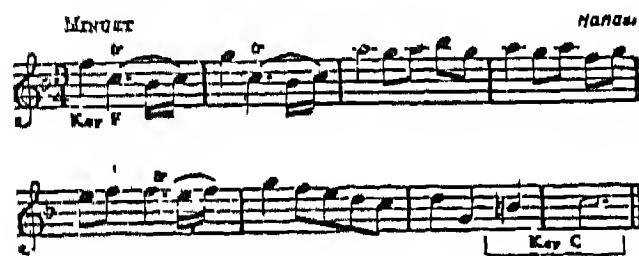
Helena Modjeska,
Polish actress

Count Bozenta Chlapowski, with whom she went to America in 1876. She had already become famous in her rendering of Shakespearean heroines, and in 1877 she appeared at San Francisco, acting in English. In Great Britain she made successes as Mary Stuart, Lady Macbeth, and La Dame aux Camélias. She died at Bay City, Calif., April 9, 1909.

Mödling. Town of Austria. It is 8 m. S.S.W. of Vienna, at the entrance of the picturesque Brühl valley, and is a popular resort of the Viennese. It has the 15th century church of S. Othmar, and an agricultural school. Metal goods, boots and shoes are manufactured. Pop. 18,000.

Modoc. American Indian tribe, also called Maklaks. Their home was in the part of the U.S.A. now called Oregon and California. With their northern neighbours the Klamath they formed the Lutuami. The few survivors of struggles with white settlers live on the Klamath reservation in the S.W. of Oregon.

Modulation. In music, a change of key, or the passing from one scale of tonality to another. Thus, the following passes from key F to key C:



The same little piece afterwards touches the keys of D minor and G minor. When the modulations are to such related keys, they are called natural modulations; when a plunge is suddenly made to a more distant key, such as from F to B, the modulation is called extraneous. Chromatic modulation is when the change is effected by chromatic chords. Enharmonic modulation includes a chromatic or extraneous change, together with a substitution of notes, such as the key of B instead of C flat. (See Key.)

In radio, modulation refers to the method in which the signals representing sound waves are added to the high-frequency carrier wave. In amplitude modulation the wave form of the signal is reproduced as variations in the peak strength of the carrier wave. In frequency modulation (*q.v.*) it is the frequency itself of the carrier wave which varies with the signal (see Radio). Phase modulation has also been used in radio transmission, and sound signals have been conveyed by modulating either the duration or the position on a time scale of high-frequency radar pulses.

Module. Literally, a little measure. In architecture it is a unit of measurement used for determining the proportions of the various parts of a building; the unit varying according to the style of architecture. This system was

used by Vitruvius. The word is also used in hydraulics for measuring the flow of water. In prefabricated construction the module is the measurement on which the sizes of the structural units are based; *e.g.* a module of 4 ft. is a convenient width for wall, floor, and roof units, and a unit of 8 ft. (2 modules) suits the usual floor-to-ceiling height. In planning, a grid of module squares is invariably drawn to scale.

Modulus. Term used in mathematics and physics. In mathematics it is usually a constant multiplier or coefficient involved in a given function of a variable. In physics it is a constant which gives the ratio between the amount of physical effect and the force causing this effect, *e.g.* Young's modulus of elasticity. A modulus is the constant factor for converting from one system of units to another.

Modus Vivendi (Lat., way of living). Term applied to an informal agreement between the pope and a government for the regulation of R.C. ecclesiastical affairs in any country. This is a substitute for a concordat.

Möen. Island of Denmark. It lies in the Baltic, between Zealand and Falster. It has an irregular outline, and its picturesque limestone cliffs rise to 500 ft. Farming and fishing are the industries. Stege, a seaport on the N.W. coast, is the chief town. Area, 81 sq. m.

Moeran, ERNEST JOHN (1894–1950). British composer. Born at Heston, Middlesex, Dec. 31, 1894, he was educated at Uppingham and the R.C.M., studying composition under John Ireland. Moeran's family came from Ireland and he resided much in that country, his work being inspired by its folk idiom. His 1st rhapsody was performed under Harty at Manchester in 1924. His larger works are a symphony in G minor, 1938; violin concerto, 1942; cello concerto, 1945, written for and performed by his wife, Peers Coetmore. He died at Kenmore, Ireland, Dec. 1, 1950.



E. J. Moeran,
British composer

Moerdijk Bridges. Two bridges across the Hollands Diep in the Netherlands. The rly. bridge, nearly a mile long, was constructed 1868–71; the road bridge, $\frac{3}{4}$ m. long, 1933–37. They take their name from the village of

Moerdijk, which lies $7\frac{1}{2}$ m. S.S.E. of Dordrecht on the S. side of this wide, sluggish channel (one of the outlets into which the Maas and the Waal drain) which separates the prov. of S. Holland from N. Brabant; they form the sole direct means of communication between the N. and the S. of the Netherlands. German parachutists seized them on May 10, 1940, and four days later German armour poured over them into "Fortress Holland," outflanking the water defences to the E.

When the Allies advanced into the Netherlands in 1944, the Germans blew up three spans of the rly. bridge and severely damaged the road bridge so that although Moerdijk village was liberated Nov. 8 by the 1st Polish armoured div., the Allied advance stopped there. After Germany's surrender and the liberation of the whole of the Netherlands, a temporary bridge carrying a single rly. track, and incorporating part of the (temporary) Waterloo bridge from London, was built and opened to traffic Sept., 1946. In 1952 plans were made for a new rly. bridge.

Moeris, LAKE. Classical name of a sheet of water in central Egypt, in the Fayum district, in Egyptian Mer-Wer great canal. It formerly covered a considerable area. The portion still remaining is 34 m. long by 6 m. broad, and is called the Birket-el-Kerun (sometimes spelled Karun or Qarun). Its embankment and partial reclamation were the work of Amenemhat III. On its banks was the celebrated Labyrinth described by Herodotus. See Labyrinth: Medinet-el-Fayum.

Moesia. Prov. of the Roman empire. It roughly corresponded to the parts of Serbia and Bulgaria N. of the Balkan range. A Celtic land, it was conquered by the Romans 29–15 B.C., and by the invitation of the Emperor Valens was settled in A.D. 375 by Visi-Goths, who were thenceforth called Moeso-Goths. See Goths.

Moeuvres. Village of France, in the dept. of Pas-de-Calais. It is immediately E. of Bourlon Wood and is memorable for two heroic episodes in the First Great War. Here in Nov., 1917, a company of the 13th Essex, surrounded by German forces, fought to the last man. It was also the scene of a stand by Corporal D. F. Hunter, V.C., and six men of the 1/5 batt. H.L.I. (52nd div.), in Sept., 1918. This party not only maintained their position but

inflicted casualties on the enemy, and when Moeuvres was retaken by the British, regained their unit without loss.

Moffat. Police burgh and holiday resort of Dumfriesshire, Scotland. It stands on the Annan, 63 m. S. by W. of Edinburgh. It was for many years a spa, having mineral springs first used about 1750. The beautiful scenery around continues to attract many visitors; the town has industrial activities, and is a noted angling centre. Pop. (1951) 2,114.



Moffat arms

tors; the town has industrial activities, and is a noted angling centre. Pop. (1951) 2,114.

Moffat, ROBERT (1795–1883). Scottish missionary. Born at Ormiston, E. Lothian, Dec. 21, 1795, he worked as a gardener. Soon he offered his services to the London Missionary Society and in 1816 went out to S. Africa. He stayed in that country until 1870, travelling about and indifferent to danger, introducing Christianity and civilization to the natives. He translated the Bible into the language of the Bechuana, and wrote *Missionary Labours and Scenes in S. Africa*, 1842. In 1819 he married Mary Smith (1795–1870), who was also devoted to the work, and their daughter became the wife of David Livingstone. Moffat died at Leigh, Kent, Aug. 9, 1883.



Robert Moffat

Moffatt, JAMES (1870–1944). Scottish divine. Born in Glasgow, July 4, 1870, he was educated at the academy and university there. Ordained in 1896, he delivered the Jowett lectures in 1907, and during 1911–15 was Yates professor of Greek and N.T. exegesis



James Moffatt, Scottish divine

at Mansfield College, Oxford. From 1927 to 1939 he was professor of church history in the United Theological Seminary, N.Y. Moffatt is best known as a translator of the Bible; he revised his earlier version of the N.T. in 1924, and made a similar version of the O.T. His work was criticised



Moffat, Dumfriesshire. General view of the town from the west

for its colloquialisms and use of the Scottish vernacular. An introduction to the Literature of the N.T. has become a standard book. Moffatt died June 27, 1944.

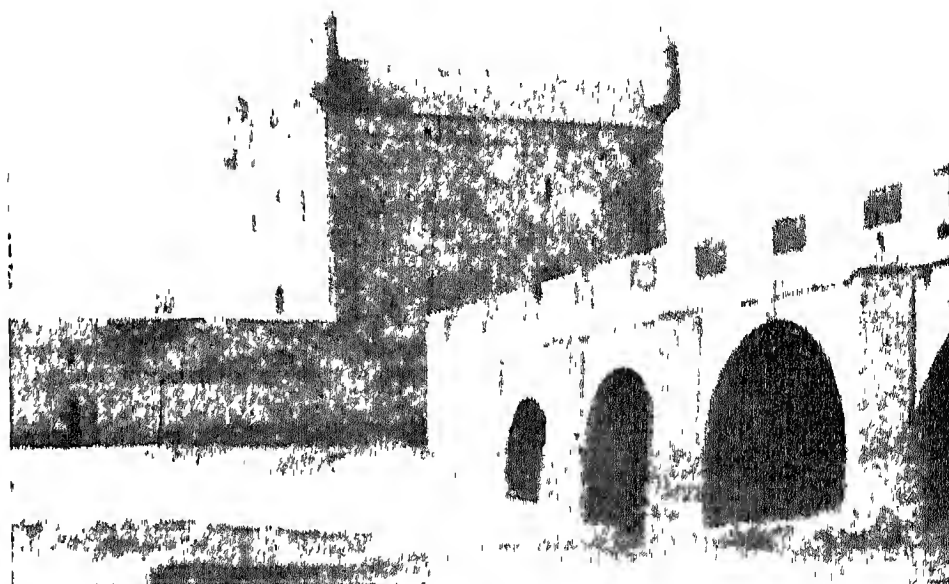
Mofussil. Anglo-Indian term meaning the provinces. It is applied to the country stations and districts, or the rural parts of a district, as distinct respectively from the presidency or the chief station. It comes from Arabic *ma-fassal* (separate, particular, hence provincial).

Mogadishu (Ital. Mogadiscio). Seaport of Italian Somaliland. Situated 270 m. N.E. of the mouth of Juba river, it is connected by a short rly. with Afgoi in the interior, and was the administrative centre of the Somali territories under Italian rule. Developed into a naval and military base by the Italians, it was strongly garrisoned when Italy entered the Second Great War. Bombed from the air on several occasions during 1940, and bombarded by light forces of the Royal Navy, Nov. 17, it was captured by British Imperial troops on Feb. 25, 1941, and became an important supply base for the subsequent conquest of Italian E. Africa; it also remained the centre for British administration of (Italian) Somaliland, developing on some scale the manufacture of soap, margarine, buttons, bricks, boot polish, pottery, glass, beer, and tinned foods.

Mogadishu was the scene, Jan. 13, 1948, of serious rioting, resulting in 67 casualties, 52 of them Italian, between members of the Somali Youth league, demanding an independent Somaliland, and Italian colonists, disturbances coinciding with the presence of the four-power commission considering the disposal of former

Italian colonies. Pop. (1956) 77,556, of whom 3,500 were Italian. See Benadir, illus.; East Africa Campaign; Italy; Somaliland.

Mogador OR ESSUEIRA. Seaport of Morocco. It is 130 m. W. of Marrakesh. It has a good harbour, and exports local produce. It was founded in 1760, and its chief building is the citadel. Pop. (est.) 32,000.



Mogador, Morocco. City water tower and aqueduct

Mogilev. A town of White Russia S.S.R., capital of a region of the same name. It is on the Dnieper, about 100 m. E. of Minsk, and has rly. connexion with Moscow. Its industries include tanning, and the making of tractors, artificial fibres, clothing, and furniture. In the 15th century, the Polish kings claimed it; it surrendered to Russia in 1654, was taken by the Swedes early in the 18th century, annexed by Russia in 1772. It was long famous for its two cathedrals, one built in 1780 by Catherine II of Russia and Joseph II of Austria. During the Napoleonic invasion Bagration's forces were defeated near here in 1812. Pop. (est.) 80,000.

Mogilev region, drained by the Dnieper and the Sozh, grows flax and potatoes, raises hogs; industries include dairy farming, distilling, lumbering, paper and glass making. Area 8,000 sq. m. Pop. (est.) 840,000.

Mogilev-Podolski. Town of Ukraine S.S.R., in Vinnitsa region, 200 m. N.W. of Odessa. It is on the left bank of the Dniester,

and was founded about 1690; it developed rapidly, and was annexed from the Poles by Russia in 1795. The town is on the frontier of Moldavia S.S.R. (formerly Bessarabia). It has food canning factories, timber mills, and metal foundries. Captured by German and Rumanian forces in July, 1941, it was recaptured by the Russians March 20, 1944.

Mogul (Arab. *mughal*, Mongol). Name applied to the empire founded c. 1526, by Babar (*q.v.*), the Mahomedan conqueror of India. Under his grandson Akbar (1542-1605) the empire was greatly extended. On the death of Aurungzebe (1707) it fell to pieces, and in 1858 it finally ceased to exist. See Akbar; Babar; India.

Mohacs. Town of Hungary. It is situated on the right bank of the Danube, 40 m. E. of Pecs, and is a rly. junction and a steamer station with some trade in coal. It has manufactures of silk, timber, and bricks. Pop. 17,228.

Mohacs is best known as the scene of two battles. The first, Aug. 29, 1526, was the defeat of Louis II (*q.v.*) of Hungary by Soliman the Magnificent, when of the whole Hungarian force of 25,000 men, 24,000 fell on the field, including Louis himself. This defeat left the road open to Buda, which was entered and sacked by the Turks, Sept. 12. The second battle, Aug. 12, 1687, saw the defeat of the Turks by the Austrian army of Charles of Lorraine, and was one of the decisive battles in the campaign which eventually drove the Turks out of Christian Europe. Mohacs was captured from German and Hungarian troops by units of the Russians, Nov. 29, 1944. *Pron.* Mo-hatch.

Mohair (Arab. *mukhayyar*, choice, select). Fleece of the Angora goat. Mohair has been imported from Turkey since the 17th century at least, when it was used for making camlets for cloaks. Gimp, fancy buttons, and button-holes were made of mohair twist, hair for the purpose being brought over in the form of spun yarn. Mohair spinning has been carried on in Bradford, Yorkshire, on a large scale since 1848. The better qualities are taken for dress goods, and others are made into plushes, braids, astrakhans, and heavy cloths. Turkey mohair normally commands the best prices, but there are at the Cape three times as many Angora goats as in Asia Minor. Cape kids from the young of the South African goats is the finest procurable hair. Angora

goat ranching has extended much in the western U.S.A., and the manufacture of mohair goods has largely increased in America. See Angora; Wool.

Mohammed. Name, a variant of Mahomet, of six sultans of Turkey. The two most important (II and V) are separately noticed.

Mohammed I reigned 1413-21. By constant warfare he recovered territories lost by his father, Bayazid, who had been overwhelmed by the forces of Timur. This sultan appears to have been a man of culture. The reign of Mohammed III, 1595-1603, was mainly taken up in fighting against Austria, but before its end he was involved in a war with Persia, and had to contend with an insurrection in Constantinople. Mohammed IV reigned during 1648-87. This was the period when the Kuprili family was directing the affairs of Turkey, and during the reign war was carried on with Austria and Poland.

Mohammed VI became sultan in 1918. Born Jan. 12, 1861, he was the son of sultan Abdul Medjid, and the brother of Mohammed V, whom he succeeded July 3, 1918. He was deposed Nov., 1922 and died at San Remo, May 15, 1926.

Mohammed II (1430-81). Sultan of Turkey, known as Mohammed the Conqueror (El Fātyh). Son of Murad II, he was born at Adrianople, and succeeded his father in 1451. In 1453, at the head of over 150,000 men and a fleet of 400 vessels, he captured Constantinople from the Greek emperor, Constantine Palaeologus, after a siege of 53 days. Making Constantinople his capital, he embarked on a long series of wars. He subdued Serbia in 1459, in spite of his memorable defeat at Belgrade by Hunyadi, 1456, made himself master of the Morea, 1460, of Trebizond, 1461, of Lesbos, 1462, and of Wallachia and Bosnia, 1463. In 1472 he overcame the Persian forces in Cappadocia, and took Caffa in the Crimea from the Genoese in 1475. In 1478 he forced Venice to sign peace and surrender Skutari in Albania, and in 1480 he attacked the Neapolitans and captured Otranto. Shortly afterwards he died at Gebze, and was succeeded by Bayazid II. See Turkey: History.



Mohammed V,
Sultan of Turkey

Mohammed V OR MEHMED RESHAD (1844-1918). Sultan of Turkey. Born November 3, 1844, younger brother of Sultan Abdul Hamid II (*q.v.*) he lived in dull and isolated obscurity most of his life. A student and deeply religious, he only emerged into prominence on the deposition of Abdul Hamid on April 27, 1909, on which day he was proclaimed his successor. He succeeded to a heritage of misgovernment, and throughout his reign was a mere figurehead, the real power being in the hands of the Young Turk party, headed by Enver Pasha, Talaat Bey, and others. The Italian and Balkan wars and the increasing influence of Germany in Turkish affairs were troubles with which he had to contend. He is believed to have been by no means willing to side with Germany in the First Great War, and for a while did what he could to avoid a rupture with the Allies, but was overruled. He died July 3, 1918, and was succeeded by his brother, Mohammed VI. See Turkey.

Mohammed Riza Shah Pahlevi (b. 1919). Persian ruler. Son of Riza Shah Pahlevi, he was born Oct. 27, 1919, and in 1939 married Fawzieh, the sister of King Farouk of Egypt, divorcing her 1948. He succeeded to the throne on his father's abdication, Sept. 16, 1941.



Mohammed Riza,
Persian ruler

Mohammed Zahir Shah (b. 1914). King of Afghanistan. Born in Kabul, he was educated in France and at the Infantry Officers' College in Kabul. He married his cousin Umairah in 1931. In 1932 minister of war and of education, he ascended the throne on the assassination of his father, Mohammed Nadir Shah, Nov. 8, 1933.



Mohammed Zahir,
King of Afghanistan

Mohammerah. This Persian seaport is more frequently known as Khorramshahr (*q.v.*).

Moharram OR MUHARRAM (Arab., sacred). First month of the Mahomedan year; also a religious celebration during that month. The celebration is observed by Shiites as a time of mourning and

fasting to commemorate the martyrdom of Hasan and Hussein, grandsons of Mahomet. A miracle play is performed on the anniversary of the death of Hussein. In India the Moharrem ceremonies are observed by both Sunnites and Shiites, and also by Hindus, especially Marathas, as a festival of rejoicing rather than of mourning.

Mohawks (Narraganset, man-eaters). North American Indian tribe of Iroquoian stock, formerly one of the Six Nations. Their location between the St. Lawrence and the Catskills led to early trade relations, 1614, with the Dutch who exchanged firearms for pelts. They eventually migrated to Canada.

Mohawks or **MOHOCKS**. London fraternity of dissolute young men of fashion in the early 18th century, the name being adopted from the Mohawk tribe. They were the successors of the so-called "scourers," and their favourite exploits were beating the watch, slitting noses, and rolling women in barrels down Snow Hill. The Tories endeavoured to saddle the Whigs with the Mohawks' delinquencies; in his *Journal to Stella* Dean Swift says: "They are all Whigs." A royal proclamation was issued against them, March 18, 1712.

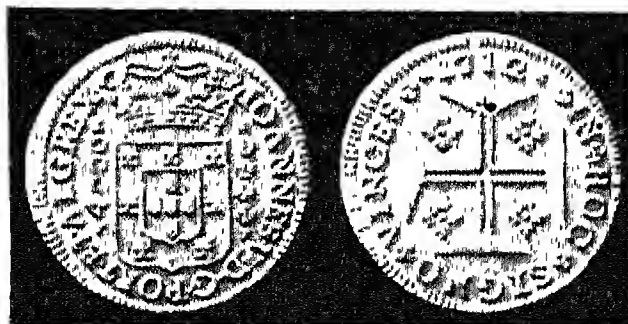
Mohenjo-Daro. Ancient city in the Indus valley (Sind) whose excavation has revealed a civilization of c. 2500-1600 B.C. See *under* Indus.

Mohicans. North American Indian tribe in the Hudson valley; their kin, the Mohegan (wolf) occupied E. Connecticut. Of Algonquian stock they were similar in culture to other Algonquian tribes of the Atlantic coast. They lived in communal bark-houses, and many of their villages were stockaded. The men wore feather mantles, and the women wampum (*q.v.*). Although both the Mohican and Mohegan tribes as such are extinct, a few survivors of mixed blood remain.

Mohl, Hugo von (1805-1872). German botanist. Born at Stuttgart on April 8, 1805, he was educated at Tübingen and Munich and became professor of botany at Tübingen in 1832, holding the position for 40 years. His researches into histology led him to suggest the word protoplasm and to describe the behaviour of protoplasm in cell-division. He was the true founder of the cell theory. His important *Die Vegetabilische Zelle* appeared in 1851, being translated into English in 1852. He died April 1, 1872.

Mohmands. Tribesmen inhabiting the country north of the Kabul river south of Bajaur on the N.W. frontier of Pakistan. The Durand line which divided India from Afghanistan passed through the country of the Mohmands, who received special assurances that they should not suffer from the separation from Afghanistan. That did not prevent the Mohmands from giving considerable trouble four years later (1897), when a general outbreak on the frontier made them fear annexation. They joined with their neighbours the Afridis and Swatis in attacks on administered territory. In this campaign Winston Churchill, as the correspondent of the *Daily Telegraph* and *Pioneer* (India), won his journalistic spurs (The Malakand Campaign). The tale of expeditions against the Mohmands goes back, however, to East India Company days, for the first took place in 1851-52; others were in 1854, 1864, 1879, and 1880. The Mohmand's economic existence is precarious, as the crops grown are dependent on adequate rainfall, which is not always to be depended on. The population of Mohmand tribes on the Pakistan side of the Durand line is about 100,000, of whom 30,000 are fighting men. Area about 1,100 sq. miles.

Möhne Dam. Structure on the Möhne river, Westphalia, Germany. Constructed to supply water to German industry in the Ruhr, and to canals and hydro-electric generator stations, the dam was about 850 yds. long, measured 140 ft. alike in thickness and height, and was built of solid concrete. It retained 140,000,000 tons of water. On May 17, 1943, it was attacked and breached by R.A.F. bombers carrying special mines. The Eder dam was also breached the same night (the third dam attacked, the Sorpe, was not); the released waters swamped vast areas of land, and flooded factories, railways, power stations, and towns, Kassel being inundated. The destruction of the dams was part of the plan to paralyse the heavy industries of the Ruhr by air attack. See *Air Raid illus.* in page 203.



Moidore. Obverse and reverse of the Portuguese coin, $\frac{1}{2}$ actual size

Mohs Scale. Mineralogical scale determining hardness by comparison with a standard set of minerals. It is as follows:

Hardness	Standard Mineral
1	Talc
2	Gypsum
3	Calcite
4	Fluorite
5	Apatite
6	Orthoclase
7	Quartz
8	Topaz
9	Corundum
10	Diamond

As an example, galena (hardness 2.5) scratches gypsum (hardness 2) but is scratched by calcite (hardness 3). The difference in hardness between any two minerals of the Mohs Scale is not claimed to be in any way constant. The scale was first introduced in 1820 by a German mineralogist, Friedrich Mohs (1773-1839).

Mohun, BARON. Irish title borne from 1628 to 1712 by the family of Mohun. John Mohun (c. 1592-1640)

was the first holder, but the best known is Charles Mohun, the 4th (c. 1675-1712). A son of the 3rd baron, he soon became known for his riotous conduct. In 1692 he helped a friend, Richard Hill, in an attempt to carry off the actress, Mrs. Bracegirdle, this leading to a scuffle between him and William Mountfort, the actor, in which the latter was killed. Mohun was tried by his peers and acquitted, pleading that he killed his man in fair fight, and in 1699 he was similarly relieved from a charge of murder. On Nov. 15, 1712, he fought a duel in Hyde Park with the 4th duke of Hamilton; both were killed, and the barony became extinct.

Moi. Annamese collective name for aboriginal hill-tribes in Indo-China. Estimated at 600,000, they display some ethnic admixture but are essentially long-headed, level-eyed Indonesians. Their chiefs are elected, their social organization is patrilineal, and endogamy is usual, though there are variations from tribe to tribe. The Lao name for them is Kha.

Moidore (Port. *moeda d'ouro*, money of gold). Obsolete Portuguese gold coin worth about 13s. 6d. The double moidore, valued at 4,800 reis, or 27s., and not minted after 1732, was current in Western Europe (including Ireland) and in the West Indies long after that



4th Baron Mohun, Irish peer
After Kneller

date. The moidore was also called the lisbonine.

Moine Series. A group of rocks named after A' Mhoine in Sutherland and covering most of Scotland N. of the Great Glen, as well as parts of Inverness, Perth, and Argyll to the S. of it. The rocks are probably Pre-Cambrian in age, and may be equivalent to the Torridonian sandstones of the N.W. coast. The Moines are dominantly metamorphosed sediments, once sandstones and shales, but now granulites and schists. Their origin is obscure, but they may be altered beds of volcanic ashes. The relationship of the Moines to other Pre-Cambrian rocks in Scotland and the age of their metamorphism are still matters of considerable controversy. See Geology; Rocks; Pre-Cambrian.

Moine Thrust. In geology, a great thrust fault which runs nearly parallel to the N.W. coast of Scotland from Loch Erriboll to Sleat in Skye, and probably thence to the Sound of Iona and to Islay. The thrust zone was formed during the Caledonian mountain building movements of post-Silurian age. It carries metamorphosed rocks of the Moine series (*q.v.*) W.N.W. over Cambrian, Torridonian, and Lewisian rocks. The thrust dips gently E.S.E., and the movements on it were locally at least 10 miles. It was the first great thrust zone to be recognized and described in detail. See Fault; Geology.

Moir, DAVID MACBETH (1798–1851). Scottish humorist. He was born at Musselburgh, Jan. 5,



David Moir,
Scottish humorist

1798, and spent his life there engaged in medical practice. Over the signature Delta he contributed much verse to Blackwood's Magazine. He is remembered chiefly by his

Autobiography of Mansie Wauch, a picture of humble Scottish life. Moir died July 6, 1851.

Moirai. In classical mythology, Greek name for the Fates, goddesses who presided over the destiny of man. The Latin name for them was Parcae. See Fates.

Moiré (Fr., watered). Term applied to fabrics bearing an irregular wavy or jagged figure produced in cloth finishing. This watered effect is the same that is seen when two layers of light cloth

are superimposed. The permanent watered or moiré effect is obtained by the use of water and pressure. The cloth is laid in layers, and an impression of the back of one layer is made on the face of the next. Silk fabrics so treated are generally named moirés, worsted fabrics moreens, and cotton fabrics moirettes. The perfection of the result is judged by the size of the figures.

Moiseiwitsch, BENNO (b. 1890). Russian-born British pianist. Born of Jewish stock at Odessa, Russia,



B. Moiseiwitsch,
Russian-born
British pianist

Feb. 22, 1890, he studied at the Imperial School of Music there (where he won the Rubenstein prize at the age of 9) and later under Leschetitzky in Vienna. Coming to England, he made his début as a concert pianist at Queen's Hall in 1909, and was an immediate success. An executant of great power and brilliant interpretative ability, especially associated with the works of his friend Rachmaninov, he made repeated world tours and became a naturalised British subject in 1937.

Moissac. Town of France, in the dept. of Tarn-et-Garonne. It lies on the right bank of the Tarn, 17 m. by rly. W.N.W. of Montauban on the important Canal Latéral, and is a centre of local agricultural and wine trade. The S. portal of the ancient church of S. Pierre is a remarkable example of 12th century Gothic sculpture. The adjoining cloister, built c. 1100, is also part of the remains of a famous abbey, founded in the 7th century, affiliated to the order of Cluny in the 11th, and suppressed during the Revolution. Pop. 8,700.

Moissan, HENRI (1852–1907). French chemist. He was born in Paris, Sept. 28, 1852, and in 1889 was professor of mineral chemistry, at the school of pharmacy. In 1900 appointed professor of chemistry at the Sorbonne, he was awarded the Nobel prize for chemistry in 1906. He died in Paris, Feb. 20, 1907.

Moissan is famous for his work on fluorine and the production



Henri Moissan,
French chemist

of artificial diamonds by the sudden cooling of a molten iron mass containing dissolved carbon. This latter discovery caused a great sensation at the time, but the diamonds produced by this method have never been commercially successful. Moissan was also responsible for an improved method of acetylene production.

Moivre, ABRAHAM DE (1667–1754). Anglo-French mathematician. Born May 26, 1667, at Vitry in Champagne, he came to England, 1688, and remained there for the rest of his life. He became a personal friend of Sir Isaac Newton, to whom he owed much of his mathematical training. De Moivre was made a fellow of the Royal Society in 1697. His chief title to fame is a theorem in trigonometry which opened up a large branch of mathematics, and which still bears his name. His book *The Doctrine of Chances*, first published in 1718, was for long a classic. He died Nov. 27, 1754, in London. See Trigonometry.

Mojaisk. Town of R.S.F.S.R. in Moscow region. It is about 65 m. S.W. of Moscow, at the confluence of the Petrovka and Moskova rivers. Of strategical importance, it was founded in the 13th century; Ivan the Terrible built a fortress here in 1541.

In the Second Great War it was one of the key-towns to the Russian capital. Having captured it in 1941, the Germans converted Mojaisk into a bastion with three general lines of defence. With the recapture of the town by the Russians, Jan. 19, 1942, the German threat to Moscow was virtually ended.

Moji. Seaport and town of Japan, in Kyushu. It is in the N.E. of the island on the Strait of Shimonoseki, at the entrance to the Inland Sea. The chief export is coal; others of minor importance are cotton thread, refined sugar, cement, and timber. Ginned cotton, raw sugar, petroleum, and beancake are imported. The port became important in 1887, when it was made the terminus of the Kyushu rly. Its pop. has increased from 3,000 in 1889 to 121,611; its growth was greatly stimulated by the increase of traffic due to the war operations of 1894–95, 1900, and 1904–05, and by increased trade in the 1920s.

Mojos. Spanish name for a South American Indian tribe of Arawakan speech, between the Beni and Guapore rivers, Bolivia. Numbering about 30,000, they devote more attention than the

neighbouring Chiquitos to hunting and fishing, and have partly abandoned bows and arrows for the lasso. Best of Amazonian boatmen, their dug-outs are prepared with the aid of fire. They use lip-pendant ornaments of quartz or resin-filled canes. *Pron.* Mohos. See American Indians.

Mokume (Jap., wood grain). Name given to an art metal product made by soldering together, one upon the other, thin sheets of gold and silver, and of certain copper alloys which have been "pickled" to give them various prominent colours. Conical holes are drilled in the soldered mass and grooves are cut to various depths. The mass is then hammered until holes and grooves disappear, the product having a variegated surface like finely grained and polished wood.

Mola, EMILIO (1887-1937). Spanish soldier. Born in Cuba (then Spanish), he entered the army in 1903, and after service in Spanish Morocco was chief of staff in that country from 1926 until appointed director-general of police in Madrid in 1931, in which post he helped organize Primo de Rivera's secret police. He retired when the republic was proclaimed, but in 1935 was reappointed chief of staff in Morocco, where he was the prime mover in the army plot against the republican govt. After the civil war started he led the insurgents in N. Spain until killed in an air crash at Brivuesca, June 3, 1937.

Mola di Bari (anc. Turres Julianae). Harbour of Italy, in the prov. of Bari. It stands on the Adriatic, 12 m. S.E. of Bari. Cattle, grain, wine, and olive oil are exported. Pop. (1951) 21,461.

Molasse. In geology, name given to a group of coarse sand and gravel deposits occurring N. of the Alps in Switzerland. They were derived by erosion from the rising mountain chain as it was uplifted, and are mostly of fresh water origin, but some marine deposits also occur in them. They are of Oligocene and Miocene age.

Molasses. The thick mother liquor remaining after the removal of all the crystallisable sugar at the refinery. In countries such as Jamaica, where rum is an important item in production, its disposal presents no difficulty, but elsewhere the problem is more complex for, though on fermentation and distillation it yields alcohol, this is not generally economical. Generally molasses contains about 50 p.c. sugars, and

by special chemical treatments a further yield of pure sugar can be obtained. In the U.S.A. molasses is the name for treacle.

Molay, JACQUES BERNARD DE (c. 1243-1314). A French grand master of the order of the Templars. Born at Molay, in the Juras, he entered the Templars at Beaune about 1265 and early distinguished himself in Palestine. Elected grand master in 1298, he retired with the Templars to Cyprus in 1299 until summoned to France by Pope Clement V in 1306. On Oct. 13, 1307, he was arrested with all the members of his order in France by order of Philip the Fair. Put to the torture, he confessed the truth of certain serious allegations against the Templars, and spent several years in prison before being brought up for sentence. He then recanted his confession, and with a colleague, Gaufrid de Charney, was condemned as a heretic and burnt at the stake, March 18, 1314. His death marked the end of the military orders which gave so much temporal power to the papacy. See Knights Templar.

Mold. Urban dist. and market town of Flintshire, Wales; also the county town. It is 13 m. W. by S. of Chester, stands on the Alyn, and is served by rly. The chief buildings are S. Mary's church, the county buildings, town hall, and library. The town had a castle in the Middle Ages, and earlier there was a Roman camp here on a hill, now called Bailey Hill. Market days, Wed. and Sat. Pop. (1951) 6,436.

Moldau. German name of the Czech-Slovak river Vltava (*q.v.*).

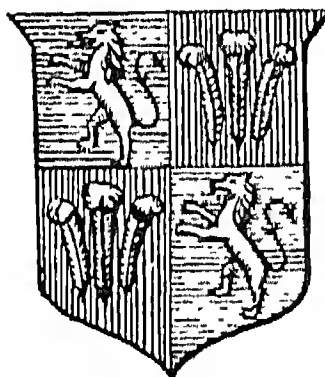
Moldavia. Soviet Socialist republic. It was established on Aug. 2, 1940, by a union of part of Moldavia A.S.S.R. (formerly in Ukraine S.S.R.), and Bessarabia, returned to Russia by Rumania, June 28, 1940 (confirmed by the peace treaty 1947) except the area bordering the Black Sea (which was included in Ukraine). It is bounded on the W. by the Prut, E., N., and S. by Ukraine, and has an area of 13,100 square miles. Kishinev is the capital.

Moldavia is predominantly agricultural, the crops being wheat, maize, sugar beet, fruit, and tobacco. It was noted from tsarist times for orchards and vineyards.

It has woodworking, machinery, clothing, and tanning industries; but considerable lignite, gypsum, and phosphorite deposits are unexploited. Principal communications are by road and along some 400 m. of waterway on the Dniester, which provides power for electricity generating stations. In the Second Great War Moldavia in 1941 was invaded and occupied by German and Rumanian troops. All Bessarabia was re-incorporated with Rumania, but was reoccupied by Russia when Soviet armies reconquered the area in 1944. Pop. 3,000,000.

Moldavia or MOLDOVA. Historically, a district of Rumania. Wallachia, Transylvania, and the Bukowina bound it on the W. and Bessarabia on the E. The Carpathians on the W. are its most striking natural feature, and its rivers, the chief of which is the Seret, descend from them to the river Prut. Jassy is the capital; other large towns are Botosani and Bacau. Area is about 14,700 sq. m. and pop. over 2,000,000.

In the 13th and 14th cents. Moldavia, which takes its name from the Moldova, a tributary of the Seret, was independent; and under Alexander the Wise and Stephen the Great it flourished in the 15th cent., the latter prince defeating a powerful combination of Poles, Magyars, and Turks at Rahova in 1457. Tributary to the Turks from 1511, it was farmed



Mold arms



Mold, Flintshire. Ruins of the medieval castle

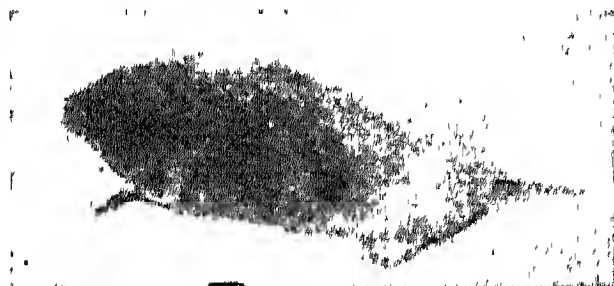
out by them to the Greek Phanariote princes, who had some measure of independence. Partly through the efforts of Russia, Moldavia was liberated from the Turkish yoke and came under Russian protection, 1829. The union of Moldavia and the principality of Wallachia under the name of Rumania was proclaimed at Jassy and Bukarest, Dec. 23, 1861, but they had been virtually united two years before under Col. Cuza, later styled Alexander I, who had been elected prince of Moldavia and Wallachia. In the First Great War the Rumanians, sup-

ported by the Russians, successfully defended Moldavia in 1916-17 against the Austro-Germans. Much of the country was devastated by the contending Soviet and Axis armies in the Second Great War. In its final drive to clear the province of German troops, the Red Army secured a bridgehead W. of the Prut in April 1944, but bitter fighting ensued before Jassy surrendered to Malinovsky's 2nd Ukrainian army in Aug. Frontier adjustments fixed the Prut as the E. boundary of Moldavia and made this prov. the most easterly of Rumania.

Molde. Seaport of Norway, in Möre co., 20 m. N.W. of Aandsnes at the entrance to Romsdals Fjord. It has a good harbour and trades in timber, tar, and fish. During the Second Great War King Haakon VII with the Norwegian royal family and ministers embarked here for Great Britain, June 10, 1940. The Germans bombed the town and caused considerable damage.

Mole. Pigmented spot on the skin, usually raised, and covered with hair. Removal involves surgical or electrical treatment. Some moles tend to malignant change in later life.

Mole. Name given to a large, widely distributed family of insectivorous mammals (*Talpidae*).



Mole. Specimen of the common European variety

The European mole (*Talpa europaea*), common in Great Britain, is about 6 ins. in length and covered with velvety greyish-black fur. The hairs are set vertically in the skin, a distinct advantage to a burrowing animal, as they will lie in any direction; the body is rounded, and the fore limbs are short and provided with singularly long and strong claws. The forward position and the paddle-like action of these limbs make them powerful digging instruments. The nose is pointed, the eyes very small, and the external ears absent. A curious skeletal feature of this animal is the breastbone, which is keeled somewhat like that of a bird, and extended so far forward and upward as to involve the collar bones. The muscular development of the mole is remarkable for so small an animal.

The mole spends practically all its life underground, burrowing not far below the surface in search of the worms and grubs on which it feeds. The small heaps on the lawn are not the homes of the animal, but simply the mould cast out in the course of burrowing, whence its popular name, mould-warp, earth caster. The hill or nursery of a mole is much larger, and usually constructed in an open field, but always near to a water supply. It consists of a central chamber a few inches below the surface, often surrounded by several galleries and tunnels. The nest chamber is lined with grass and leaves, and is apparently used only once. One litter is produced in the year, usually numbering three or four young ones, born in May or June.

Feeding entirely on worms, grubs, and insects, the mole is harmless and useful to the agriculturist. But it does a certain amount of damage in burrowing among newly-sown seed, and mole casts are both unsightly and inconvenient in fields and gardens, with the result that in most districts the mole is relentlessly trapped. See Mole Shrew.

Mole (Lat. *moles*, mass). Jetty projecting from the land into water and serving as a pier, or as a pier and breakwater combined. It follows that the top surface must be formed to accommodate traffic, and that at least for a portion of its length boats may moor or berth alongside for loading or discharging cargoes.

The terms mole and pier are sometimes used indiscriminately, but strictly speaking the former is of solid construction. The construction of moles follows that of certain types of breakwaters.

A harbour may be formed by constructing two moles, the outer ends of which approach each other, leaving a sufficient opening for the safe passage of vessels in and out; in other cases a single mole may serve the purpose. Moles are sometimes constructed with the storm side at a high level and the lee side at a lower level, so as to provide shelter and berthing accommodation for vessels free from the effect of breakers. See Breakwater; Harbour.

Mole. River of England. It rises in Balcombe forest, N. Sussex, and flows 30 m. through Surrey to the Thames near Molesey. It flows through the Dorking Gap in the N. Downs between Dorking and Leatherhead, near which in dry seasons the water disappears in holes called the Swallows.

Molé, LOUIS MATHIEU, COMTE (1781-1855). French statesman. Born in Paris, Jan. 24, 1781, his youth was spent with his mother in exile, his father having lost his life in the Terror. He returned to France during the Empire and in 1806 became master of requests to Napoleon. In 1809 he was made a count, and four years later minister of justice. On the restoration, Louis XVIII accepted his allegiance and confirmed his title, appointing him minister of marine in 1815. With the accession of Louis Philippe he became minister of foreign affairs, but finding his hands tied by Talleyrand, he resigned. In 1836 he became premier, but, quarrelling with Guizot and in open hostility to Thiers, he was unable to make headway against the opposition, and resigned in 1839. He died Nov. 23, 1855.



Comte Molé, French statesman

Molé, MATHIEU (1584-1656). A French politician. A son of Édouard Molé, a lawyer who had helped Henry IV to secure the throne, he was educated at Orleans and became a lawyer. Prominent in public affairs during the time of Richelieu, in 1641 he was made president of the parlement in Paris. He was its spokesman when the members withstood Anne of Austria and Mazarin, and his conduct in Aug., 1648, in defying an angry mob, proved him a man of courage. He acted as a peacemaker during the Fronde, and died Jan. 3, 1656. Molé left some Memoirs which were published 1855-57.

Mole Cricket (*Gryllotalpa gryllotalpa*). Orthopterous (straight-winged) insect, common in Central and S. Europe, less frequently found in Great Britain. It is a member of the cricket tribe, lives underground, and preys upon worms, insects, and vegetation. It resembles the mole in habits, and its broad, modified fore limbs form excellent digging implements. The insect is nearly 2 ins. long, yellowish-brown in colour, and covered with fine, downy hair. It is known to take occasional flights by night. See Cricket.

Molecular Weight. Ratio of the weight of a molecule of any substance to the weight of the hydrogen atom. A gram-molecule is the mass of a substance in grams which is numerically equal to the molecular weight.

Molecule (Lat. *moles*, a mass). Smallest particle of any substance which can exist independently and still retain its distinctive chemical properties. In the kinetic theory of gases as evolved during the first half of the 19th century, the molecules are pictured as perfectly elastic, spherical bodies, small in size compared with the spaces between them, moving rapidly in all directions and frequently colliding. The average speed of their motion corresponds to temperature, their



Mole Rat. Specimen of the South European rodent resembling a mole

impact on the walls of a container to pressure. At 0°C and 760°Hg pressure, one c.c. of any gas contains some 2.6868×10^{19} molecules; their average speed varies from about $\frac{1}{4}$ mile (xenon) to over $1\frac{1}{4}$ mile (hydrogen) per second; the average distance travelled between collisions (mean free path) is a few millionths of a cm., from 100 to 900 times the effective diameter of an individual molecule.

Each molecule of any given substance is made up of individual atoms of chemical elements combined in a fixed proportion. The molecular weight is the sum of the separate weights of the constituent atoms. For gases, liquids, and solids in liquid solution, the molecular weight can be found experimentally and the exact number of atoms in each molecule deduced. Thus ammonia has one atom of nitrogen and three of hydrogen (NH_3); hydrogen peroxide, two atoms of hydrogen and two of oxygen (H_2O_2); cane sugar, 12 atoms of carbon, 22 of hydrogen and 11 of oxygen ($\text{C}_{12}\text{H}_{22}\text{O}_{11}$). The ability of carbon atoms to join together in long chains and ring systems leads to the large and complicated molecules of organic chemistry (see *Plastics*).

The chemical behaviour and physical properties of a substance are closely related to its molecular structure, including not only the number and kind of different atoms present but also their exact arrangement in space. For crystalline solids the distinction between separate molecules largely disappears; the atomic nuclei are

arranged in a fixed geometrical pattern (the crystal lattice), and in a sense each crystal becomes one large molecule. See *Brownian Movements*; *Chemistry*; *Crystallography*; *Gas*; *Valency*.

Molenbeek S. Jean. Town of Belgium, in the prov. of Brabant. A suburb and commune of Brussels, it lies to the W. of the capital, on a branch of the river Senne. The Canal de Charleroi has an important dock here, and there are industries in textiles, soap, rly. materials, metal works, etc.

Mole Rat (*Spalax*). Genus of rodents, related to the rats, but resembling moles in general appearance. They are well adapted to a subterranean life, with small eyes and ears. They are blind, their eyes being beneath the skin. They burrow underground, seeking the roots and bulbs on which they feed. The typical species (*S. typhlus*) is found throughout S.E. Europe, Asia Minor, Persia, and Lower Egypt.

Mole St. Nicolas. Harbour of Haiti, near the N.W. point of the island. It stands on a deep bay enclosed by a peninsula of the same name, overlooking the Windward Passage between San Domingo and Cuba. N. of the town is Cape St. Nicolas.

Molesey OR **MOULSEY.** Name of two parishes, East and West, in Surrey, England, forming part of the Esher urban district. They stand on the right bank of the Thames, 2 m. W. of Kingston, and are served by Hampton Court rly. stn. A regatta is held yearly. Near here the Mole enters the Thames, hence the name. Pop. (1951) E., 6,815; W., 7,525.

Mole Shrew OR **SHORT-TAILED SHREW.** Insectivorous mammal, related to the true moles, and



Mole Shrew. The small insectivorous mammal found in N. America and Japan

found in N.E. America. In appearance it closely resembles the common mole, but is much smaller. It burrows beneath the surface of the soil, and feeds upon small worms, mice, and insects. See *Shrew*.

Moleskin. Term applied to the velvety fur of the mole and to a cloth resembling it. The best real

moleskins are dark blue, and come from the Cambridgeshire Fens. The cloth is a strong, soft cotton fustian, used for labourers' clothes, gun-cases, etc. The surface is shaved before dyeing. See *Fur*.

Molesworth, MARY LOUISA (1839-1921). A British author. She was born in Holland in May,



Mary L. Molesworth, British author
Elliott & Fry

1839, the daughter of Charles Augustus Stewart. Writing stories from childhood, she developed a genius for writing for the young. Many of her books were written

under the pen-name of Ennis Graham. In 1861 she married Richard Molesworth (d. 1900), a nephew of the 7th Viscount Molesworth. Her story, *Lover and Husband*, appeared in 1869, and notable in a long list of its successors are *Carrots*, 1876; *The Cuckoo Clock*, 1877; *The Adventures of Herr Baby*, 1881; *The Laurel Walk*, 1898; *The Story of a Year*, 1910. She died July 21, 1921.

Molesworth, SIR WILLIAM (1810-55). A British politician. Born in London, May 23, 1810, he succeeded to

his father's baronetcy in 1823, and in 1832 was elected M.P. for East Cornwall. In 1835 he founded *The London Review* and incorporated it with *The Westminster Review*, assisted by J. S. Mill as editor. A staunch Radical, he represented Leeds, 1837-41, and Southwark, 1845-55. In 1853 he entered Aberdeen's cabinet as first commissioner of works, in which capacity he forwarded the building of Westminster Bridge. He had always been keenly interested in colonial matters, and much was hoped from his appointment as colonial secretary in July, 1855, but he died Oct. 22 in that year.



Sir W. Molesworth, British politician
After Sir J. W. Gordon

Molfetta. Harbour of Italy, in the prov. of Bari. It is on the Adriatic 16 m. by rly. N.W. of Bari, has shipbuilding yards, and trades in wine, oil, almonds, and nitre. Its Romanesque church of S. Corato dates from the 13th century. Pop. (1951) 54,576.

MOLIÈRE: CREATOR OF MODERN COMEDY

A. A. Tilley, M.A., Author of *From Montaigne to Molière*

This Encyclopedia contains articles on Molière's plays. See Comedy; France: Literature. and articles on Corneille, Racine, and other great names in French Literature

Jean Baptiste Poquelin, called Molière, the creator and the greatest master of modern comedy, was born in Paris in Jan., 1622, a son of Jean Poquelin, an upholsterer, who was employed by the court and was apparently in affluent circumstances. His mother was Marie Cressé, and he was educated at the fashionable college of Clermont, where he studied the works of Aristotle. He was destined for his father's business, but at the age of twenty-one, having conceived a strong passion for the stage, he founded with some friends a theatrical company, L'illustre Théâtre, which played unsuccessfully at Paris for two years. They then tried their fortunes in the provinces, and after five years of struggle and hardship achieved a considerable dramatic reputation. In 1658 they returned to Paris, and two years later were definitely established in the theatre of the Palais Royal.

In 1659 Molière made his début in social comedy with *Les Précieuses Ridicules*, and in 1662 he produced his first great comedy, *L'École des Femmes*. In the same year he married Armande Béjart, a girl of twenty. She was a coquette and the marriage was unhappy. Molière's principal plays besides the two already mentioned are *Le Tartuffe*, 1664; *Don Juan*, 1665; *Le Misanthrope*, 1666; *Amphitryon*, 1668; *L'Avare*, 1668; *Le Bourgeois gentilhomme*, 1670; *Les Femmes savantes*, 1672; and *Le Malade imaginaire*, 1673. Slighter, but of excellent quality, are *L'École des Maris*, 1661; *Le Mariage forcé*, 1664; *L'Amour médecin*, 1665; *Le Médecin malgré lui*, 1666; *Le Sicilien*, 1667; and the remarkable *Critique de l'École des Femmes*, 1663, which is of capital importance for the understanding of Molière's conception of his art.

Molière was a first-rate actor of comedy, his acting, like Garrick's, being distinguished for vivacity of expression and gesture. He was also an admirable theatrical manager, devoted to the interests of the company, and sparing no pains in the rehearsal of his pieces. As a writer of comedy, he is unrivalled in his mastery of the whole gamut of laughter, from the most delicate humour to the broadest farce. Though in many of his plays, from *Le Tartuffe* onwards, there is a latent element of tragedy, it is the comic aspect of life that inspires

his imagination and gives the dominating colour to his work. We laugh at *Tartuffe* even while we fear him; we laugh at *Alceste* even while we pity him. In the one Molière shows us the ridiculous side of a criminal, in the other the ridiculous side of a lovable man of virtue.

But he aspires to correct men as well as amuse them, so he ridicules their vices and follies, especially those which threaten the social fabric or its true basis, the family. In the name of common-sense and truth, he wars against hypocrisy and superstition, against atheism and libertinism, against avarice, egoism, and vanity, against *précieuses*, prudens, poetasters, bores, pedants, professional humbugs, smug provincials, and smirking courtiers. Misled by the titles of some of his plays, e.g. *Le Misanthrope*, *L'Avare*, *Le Malade imaginaire*, some critics have accused him of creating abstract types rather than individuals. But his great characters, *Tartuffe*, *Don Juan*, *Alceste*, *Célimène*, *Harpagon*, have the breadth, the complexity, the individuality of real life. As for his minor characters, he creates them at a single stroke. They are alive the moment they appear on the stage.

A special word is due to his female servants. Honest, loyal, and outspoken, the very embodiments of common-sense, they stand for Molière's hatred of affectation and intellectual arrogance; they are the representatives, so to speak, of



From a portrait of J. B. P. Molière, Lebrun's school



Molière, from the bust by J. A. Houdon
Comédie Française, Paris

his comic muse. Further, his characters are true to nature. There are no super-men and, except in his broader farces, no caricatures. Just as in real life, they are judged differently by different readers and different ages; there can be no better proof of their absolute fidelity. Some of his plays, e.g. *Don Juan*, *L'Avare*, *Le Bourgeois gentilhomme*, in their looseness of construction bear witness to the hurry in which they were written, but when Molière had time at his disposal he could build up his drama with a master's hand. If his dénouements are often weak and mechanical, it is because he cares even more for life than for art. His feeling for dramatic effect, for movement and action, is unrivalled. Even when there is little or no external action, as in *Le Misanthrope*, the dramatic interest never flags, and the action, though chiefly internal, is developed in a strictly logical sequence.

Molière's language, though mostly admirable, is occasionally, under the pressure of time, involved or careless. This has proved a stumbling-block to some critics, but its dramatic qualities make it a joy to actors. His versification at its best is easy, spirited, and vigorous. *L'Étourdi*, 1653, his earliest comedy, is brilliantly written throughout, and in the vers libres of *Amphitryon* he shows the highest skill of the versifier's art. Molière died in Paris, Feb. 17, 1673, and was buried in the cemetery behind the church of S. Joseph.

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Molina, Luis (1536-1600). A Spanish theologian. He was born at Cuenca, and became a Jesuit. He was for 20 years professor of theology at Evora. In his later years he was professor of moral theology at Madrid, where he died Oct. 12, 1600. His chief literary work, the *Agreement of Freewill with the Gifts of Grace*, 1588, in which he seeks to harmonise the freedom of the will with divine predestination, led to a long dispute between the Molinists and adherents of S. Thomas Aquinas.

Molinos, Miguel de (1628-96). Spanish mystic. He was born at Muniesa, Aragon, in June, 1628, became a priest, and in 1665 went to Rome. Here he published a book called *The Spiritual Guide*, 1675, which taught an extreme form of quietism, for which he was condemned in 1687 by the Inquisition to imprisonment for life. He died Dec. 28, 1696.

Mollison, James Allan (b. 1905). British airman. Born in Scotland, Apr. 19, 1905, Mollison was commissioned in the R.A.F.

at the age of 18. He transferred to the reserve after five years, and joined C. E. Kingsford-Smith (*q.v.*) as an air mail pilot in Australia. Mollison first became famous in 1931 with a record solo flight to England of 8 days 19½ hrs. The following year, he flew from England to Cape Town in 4 days 17 hrs. (this was also the first west-coast flight to the Cape), and made in a light aeroplane the first solo east to west crossings of the North (Aug., 1932) and South (Feb., 1933) Atlantic. With Amy Johnson (*q.v.*), to whom he was married 1932-38, he again flew the Atlantic in Aug., 1933 (the first direct flight from Great Britain to the U.S.A.), and also led the field in the first stages of the 1934 MacRobertson race to Australia (England to India in 22 hrs.). Mollison's next record flight, Oct., 1936, was New York-Newfoundland-London (coast to coast, 9 hrs. 20 mins.). In the Second Great War Mollison became a ferry pilot with Air Transport Auxiliary, and received the M.B.E. in 1946.

tends to face backwards; the shell is often internal or absent, *e.g.* the sea-hare and the sea-slug. (c) Pulmonata (Euthyneura). In this order the gills are absent and the mantle cavity acts as a lung. Most of the land and fresh-water snails are pulmonates.

Class 4. SCAPHOPODA. This is a small class whose members have a straight tubular shell. An example is Dentalium, the elephant tusk shell.

Class 5. LAMELLIBRANCHIA (Pelecypoda, or the Bivalves). Mollusca possessing a shell of two valves, one on each side of the body, which is normally compressed laterally. They are bilaterally symmetrical and have no definite head. The class includes mussels, cockles, oysters, and the clams.

Class 6. CEPHALOPODA. The main part of the foot is situated around the mouth and is divided into a number of sucker-bearing arms. The shell is in some absent or rudimentary, in others well developed. Examples include the cuttlefish, the octopus, and the nautilus. Important fossil groups, the Ammonites and the Belemnites, are found in the Palaeozoic and especially in the Mesozoic rocks.

Apart from the characteristic shell, most molluscs can be distinguished (*see illus.*) by their possession of a soft body which to varying extents is enveloped in a fold of tissue known as the mantle. Between this and the body there is the mantle cavity, in which are situated the respiratory organs named ctenidia (Greek, comb) or gills. In the bivalves the mantle consists of a thin layer of tissue with epithelial cells on either side and it may be prolonged at the posterior end to form a pair of tubular organs, the siphons through which water and food material are taken in and passed out. These siphons are especially noticeable in those molluscs which burrow deeply in sand or mud, *e.g.* cockles, Tellina, and Mya, whereas no tubular siphon is to be found in mussels, oysters, or scallops, all of which occur either attached to rocks, in shallow mud, or free-swimming.

The molluscan shell is secreted by the cells on the outside of the mantle and by the epithelium situated on the outside of the visceral mass. The shell consists of two main parts, the periostracum, or outermost layer of conchiolin, a horny substance allied to chitin, and a series of inner layers laid down later and composed mainly of crystalline calcium carbonate.

MOLLUSCA: A GROUP OF INVERTEBRATES

E. R. Trueman B.Sc

A description of the characteristics and classification of the group of living creatures called molluscs. More detailed descriptions of particular species are given under Bivalves; Cephalopoda; Gastropoda; Oyster; Slug; Snail, etc.

The phylum Mollusca (Lat. *molluscus*, softish) constitutes one of the major groups of the invertebrate animals, and contains the snails, slugs, whelks, mussels, squids, and cuttlefish, comprising approx. 60,000 living species.

The molluscs are essentially bilaterally symmetrical animals with unsegmented bodies. They possess a thickened muscular foot which is used for locomotion and is situated ventrally. Dorsally there is a visceral dome or hump normally covered by a shell which is one of the main characteristics of the phylum. Another structure occurring commonly in the molluscs is the radula, a rasp- or file-like organ situated in the mouth. It is moved to and fro producing a scraping action, so removing food material from, for example, the face of a rock.

The earliest molluscs undoubtedly occurred in the sea and some are found as fossils in the Cambrian rocks. During the Devonian period they began to inhabit fresh water, and in the Carboniferous the land. At the present time both gastropods and bivalves occur in fresh water, whereas only gastropods have become adapted for life on land.

The following is an outline classification of the Mollusca:

Class 1. SOLENOGASTRES. These are highly primitive molluscs (*e.g.* Neomenia) having a worm-like body and no shell. They possess a heart enclosed within a pericardium and a nervous system which is bilaterally symmetrical.

Class 2. PLACOPHORA. This class comprises the Chitons; its members have a broad flat foot and a calcareous shell of eight plates.

Class 3. GASTROPODA. This is the largest class, and shows typically an asymmetrical condition owing to the atrophy or disappearance of the organs of the original left side. Gastropoda usually possess a shell coiled in a helicoid or corkscrew spiral, a thickened muscular foot, a head bearing paired tentacles and eyes, and a mouth with a well-developed radula. The class may be divided into three orders:

(a) Prosobranchia (Streptoneura). The nervous system shows a typical figure of eight owing to the twisting or torsion of the visceral hump, *e.g.* the limpet and the whelk. (b) Opisthobranchia (Euthyneura). Owing to detorsion the opening of the mantle cavity

These inner layers are generally formed of at least two layers in which there may be considerable differences in the exact arrangement of the crystals. The periostracum, which is thin, is secreted by the epithelial cells situated along the edge of the mantle and covers the shell and gives protection to it from erosion.

The crystalline calcium carbonate of the inner layers is in the form of either calcite or aragonite. Most shells possess only one of these crystalline forms although a few have both types present in separate layers, *e.g.* the scallop. Whereas it is known that the shell is formed from the secretion of calcium carbonate by the epithelial cells of the mantle, the precise manner of deposition of these varying crystalline structures and the conditions which determine the presence of calcite or aragonite have not been ascertained.

In the gastropods respiration is typically carried out by a pair of gill-like structures, the ctenidia. In the primitive condition these were paired structures, one on the right and one on the left side, within the mantle cavity, but in the majority that of the right side is alone retained. By the anti-clockwise twisting or torsion of the visceral hump this ctenidium becomes situated on the left front side of the animal. Some of the gastropods have developed secondary external "gills" often arranged in a circlet around the anus, *e.g.* Doris, the sea-slug. The land snails and many of those pulmonates which occur in fresh water have no ctenidium and respire through the wall of the mantle cavity which, apart from a small opening to the exterior, is completely enclosed and functions as a pulmonary air-filled sac or lung. The cephalopods also respire by means of ctenidia within the mantle cavity.

The bivalves possess a pair of ctenidia inside the mantle and on either side of the foot; each one is composed of two plates or laminae, and upon the exact form of these the classification of the group is generally based. Respiration is by a flow of water over these gills and also over the inner surface of the mantle. The main function of the ctenidia in the bivalves is, however, concerned with feeding, for they are ciliated and cause a flow of water in a definite direction from the inhalant siphon. These gills divide the mantle cavity into inhalant and exhalant chambers, the former being ventral and some-

times anterior. The water is thus strained through a sieve of tissue between these chambers, leaving particles of food suspended on the gill. This food, together with some mucus that is secreted, is passed to the mouth by ciliary action where it is sorted out by the thickened lips or labial palps. Research has confirmed that feeding in the bivalves is purely quantitative, the selective mechanism being one in which the smaller masses only are passed to the mouth irrespective of their food value. This method of feeding is called filter feeding.

Gastropods generally obtain their food by scraping with the radula but some are filter feeders. The cephalopods have a pair of horny jaws, rather like the beak of a parrot, which are situated at the mouth.

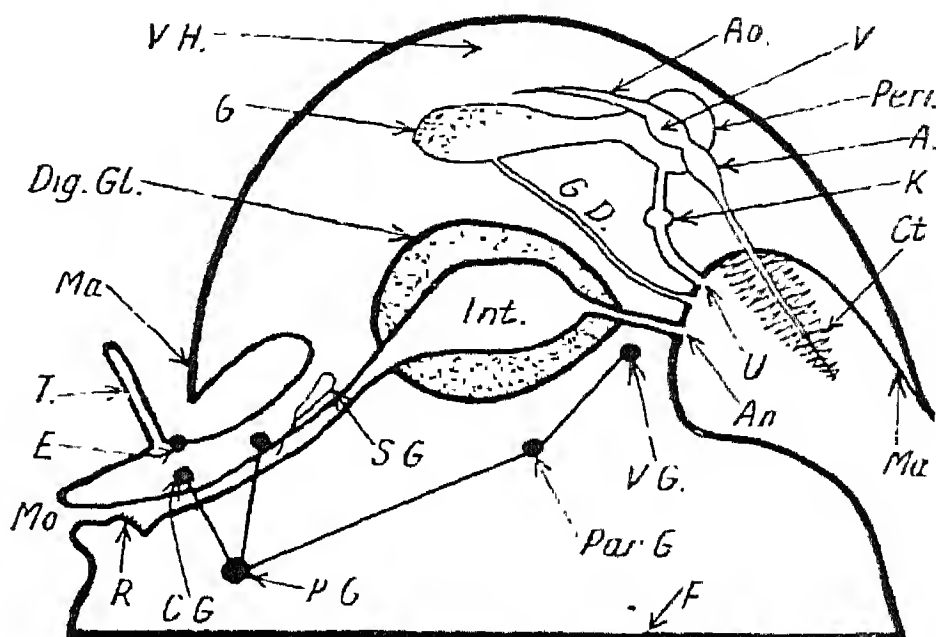
Some molluscs are carnivorous, *e.g.* the whelk, some herbivorous, *e.g.* the limpet, some omnivorous. *Teredo*, or ship worm, is one of the few animals able to digest wood directly. It bores into the wood-work of ships and piers by a rotating movement of its shell, forming a tube through the wood.

The Digestive System

Digestion in the mollusca is both extracellular and intracellular. In the gastropods salivary glands and a large liver (hepato-pancreas) are always present. The bivalves show an interesting modification associated with filter feeding. They possess a crystalline style in the stomach or anterior part of the intestine which rotates by the action of cilia. The free end of the style projects into the stomach and is constantly worn away by friction, releasing into the stomach amylase for the digestion of the carbohydrates; the fats and proteins are digested intracellularly. This is a very effective mechanism whereby a continuous flow of enzyme is produced to digest food which is being provided in a steady stream owing to the method of feeding.

The blood of molluscs is generally colourless but the pigments haemocyanin and haemoglobin are

found in certain forms, the latter in the common fresh water snail *Planorbis*. The molluscan heart consists of one or two auricles and a ventricle and is enclosed within the pericardium, a specialised part



A, auricle; Ao, aorta, in which blood flows from the ventricle; An, anus; CG, cerebral ganglion; Ct, ctenidium; Dig Gl, digestive gland; E, eye; F, foot; G, gonad; GD, gonoduct, from gonad to mantle cavity; Int, intestine; K, kidney; Ma, sections of mantle; Mo, mouth; PG, pedal ganglion; Par. G, parietal ganglion; Peri, pericardium; R, radula; SG, salivary gland; T, tentacle; U, opening of ureter into mantle cavity; V, ventricle; VG, visceral ganglion; VH, visceral hump

Mollusca. Hypothetical section of a primitive mollusc

of the coelom, which communicates with the cavity of the kidneys.

The nervous system consists primitively of a number of paired ganglia and their connexions. This condition may be seen in the more primitive members of the phylum, *e.g.* the Chiton. The gastropods usually have a pair of cerebral ganglia, closely united and situated over the gullet, giving off connectives both to each pedal ganglion and to each pleural ganglion. The connectives between this last pair of ganglia and the parietal ganglia are usually in a twisted figure of eight condition resulting from the anti-clockwise torsion of the visceral hump. In the more highly developed families a secondary symmetry occurs, owing to a detorsion or to the shortening of connectives. The twisted or streptoneurous condition is found in the limpet and the whelk, the euthyneurous in terrestrial snails and slugs.

In the cephalopods the nervous system is much more highly organized than in the gastropods or the bivalves. The ganglia of the central nervous system are closely aggregated around the oesophagus into a structure which may be called the brain. There also occur in this class very thick nerve fibres developed to produce a high speed of conduction of nervous impulses. In the vertebrate animals this is carried out by the development of a large number of thin nerve fibres.

Among the sense organs of the molluscs are : (a) statocysts, organs of balance ; (b) osphradia, chemoreceptors whose function would appear to be to test the condition of the water which enters the mantle cavity ; (c) eyes, very well developed in the cuttlefish and in certain bivalves, *e.g.* in *Pecten*, the scallop.

Reproduction in molluscs is sexual, and the sexes are usually separate. Copulation takes place in the cephalopods and in certain gastropods which have a penis. Development from the egg is typically through a veliger larva, which is free-swimming. The molluscs are used by man as food. Many species are edible, though only few, *e.g.* oysters, mussels, cockles, whelks, winkles, and certain land snails, are eaten in quantity. The shell of molluscs is of considerable economic value : *e.g.* from the shells of certain bivalves mother-of-pearl is produced. Some oysters also produce pearls (*q.v.*).

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Molluscum Contagiosum. A disease of the skin, in which small, white tumours caused by a filter-passing virus appear on the surface of various parts of the body, the face and eyelids being often involved. The disease is contagious, and the growths, if left alone, persist for a long time, but ultimately tend to disappear spontaneously. Treatment consists in incising the tumour, squeezing out the contents, and disinfecting the walls of the containing sac.

Mollwitz. Village of Silesia. It is 7 m. from Brieg, and is famous for the battle fought here, April 10, 1741, between the Austrians and the Prussians. Frederick the Great had seized Silesia, and early in 1741 the Austrians equipped an army to recover it. Under Neipperg this marched from Neisse towards Brieg, thus cutting off the Prussians from their base. The scattered forces of the latter were concentrated with some difficulty, and the two armies came into touch near Mollwitz. After a few days spent in getting into position the battle began on April 10. The Austrian horsemen attacked, and the Prussian cavalry was routed, and Frederick himself took flight. However, the trained Prussian infantry presented a far tougher front, and the Austrian infantry suffered greatly.

Molly Maguires. Name of an Irish secret society formed in 1843 in co. Monaghan for the purpose of intimidating landlords. The name was afterwards applied to an American-Irish secret society which flourished in the mining districts of Pennsylvania, U.S.A., 1854-77. In 1875 the Molly Maguires engineered a general strike in that region, and many crimes were traced to them. So serious did the situation become that a strong effort was put forth to crush the society. A Pinkerton (*q.v.*) detective succeeded in becoming a member of the organization, and on his information the leaders were arrested, convicted, and sentenced to death. The society then soon disappeared. Sir A. Conan Doyle based his story *The Valley of Fear* on the murders.

Moloch. Canaanite fire-god, the Semitic word meaning king. This Septuagint spelling represents the Hebrew Molech, whose worship, notably under Ahaz and Manasseh, involved child-sacrifice and pyre-burning (2 Kings 23). These were sacrifices to Jahveh, and the rites survived among the Jews until a late period, as is proved by references to them by Ezekiel and Jeremiah. The burning of living children in a brazen, calf-headed Moloch-image is a medieval fable.

Moloch Horridus. Australian lizard of the family Agamidae, also called spiny lizard, and spiny or thorny devil. The upper parts are liberally armed with horny spines, the head and depressed body are about $4\frac{1}{2}$ ins. in length, and the tail about $3\frac{1}{2}$ ins. Its form is much like that of a toad with a tail added ; and when alarmed it increases the resemblance by puffing out its body, and making its spines more effective for protective purposes. Its broad blotches of light and dark colour harmonise with the soil and can be varied like those of the chameleon, but to a much less extent. It is perfectly harmless, its spines being purely defensive. Its food consists of insects, chiefly ants. See Lizard colour plate.

Molokai. One of the Hawaiian Islands, Pacific Ocean. Its mountains, scored by ravines and forest clad, rise to 3,000 ft. The leper settlement, the scene of the labours of Father Damien (*q.v.*), is in the middle of the N. coast. The people live mainly on a narrow fertile strip along the S. coast. Area, 261 sq. m. Pop. 5,340.

Molopo. Former tributary of the Orange river, S. Africa. It emerges from a swallow hole in the

limestone of Marico dist., near Mafeking, and flows W., forming the N. boundary of Bechuanaland. As it crosses the Kalahari desert it becomes a dry watercourse which joins the Orange river.

Molotov. See Perm.

Molotov, VYACHESLAV MIKHAILOVICH (b. 1890). Russian politician. Molotov (originally named Seria-
bin) was educated at the St. Petersburg Polytechnic and organized revolutionary student groups. In 1917 he became a member of the Petrograd Soviet executive committee, and was appointed secretary of the central committee of the Communists of the U.S.S.R. in 1921. Molotov became chairman of the council of people's commissars in 1930 and was nominated foreign commissar in 1939, succeeding Litvinov. In that year he signed the Russo-German non-aggression pact which precipitated the Second Great War. In 1940 he visited Berlin to confer with the Nazi leaders. In 1941 he resigned his chairmanship of the council, but retained the post of foreign commissar and assumed the vice-premiership.



V. M. Molotov,
Russian politician

In July, 1941, he was appointed vice-chairman of the defence committee, and in May, 1942, signed the twenty-year Russo-British mutual assistance pact. He took part in all the important war conferences and was the leader of the Russian delegation at San Francisco in April, 1945, being present also at Potsdam in July. Molotov was one of the council of foreign ministers which had meetings in London, Moscow, and Paris during 1945-47. His uncompromising attitude led to frequent clashes with the delegates of the western powers. He ceased to be foreign minister, 1949, but remained vice-premier. On Stalin's death, he again became foreign minister, 1953-56. In 1957 he was sent as ambassador to Outer Mongolia.

During the Russo-Finnish War of 1939-40 his name was used for two weapons—the Molotov cocktail, a bottle containing a liquid that burst into flames on contact with air, used against tanks ; and the Molotov bread basket, a container fitted with a parachute that was released from an aero-

plane and opened on reaching a prearranged height above the ground, releasing a shower of incendiary bombs. This device was first used by the Russians.

Molsheim. Town of Alsace, France. It stands at the foot of the Vosges, on the river Breusch, and is a rly. junction. The buildings include a modern town hall and several churches, including a fine Roman Catholic one. Until 1702 there was a noted Jesuit college here. There are some manufactures, while the vine is grown in the neighbourhood.

Molteno, SIR JOHN CHARLES (1814-86). South African statesman. Born in London, June 5, 1814, he went to S. Africa in 1831, and engaged in business and farming at the Cape and at Nelspoort. He took part in the Kaffir War of 1846, and sat for Beaufort in the first Cape parliament, 1854. An active advocate of responsible government for the Cape Colony, he was appointed the first premier when it was conceded in 1872. He visited England in connexion with Lord Carnarvon's conference on S. African affairs, 1876, and stood for the unification of S. Africa, but strong differences of opinion led to Molteno's dismissal in Feb., 1878, and for a time he retired from public life. In 1880 he was returned for Victoria West, and resumed the office of colonial secretary, but in 1882 he finally retired, being rewarded with the K.C.M.G. He died Sept. 1, 1886.

Moltke, HELMUTH KARL BERNHARD VON (1800-91). German soldier. The founder of the modern system of military command by devolution was born of noble family at Parchim, Mecklenburg, Oct. 26, 1800. His youth was spent in Denmark, but in 1822 he entered the Prussian service. With his duties he combined the study of history, and wrote on the European events of the time. In 1835 he accepted an offer of employment by the sultan of Turkey, and served in the Balkans and Syria.

He rejoined the German army in 1840, and in 1845 published his history of the Russo-Turkish war of 1828-29, a military classic. In 1845 he married an Englishwoman, Mary Burt. After holding senior staff appointments at Coblenz,

1846, and Magdeburg, 1848, he was chosen in 1855 as adjutant to Prince Frederick William (afterwards the emperor Frederick), and with him visited France, Russia, and England.

In 1858 Moltke became chief of the general staff of the Prussian army. He based his plans for possible wars on military history. When war came against Denmark in 1864, his plan to capture the Danish army in the first battle was imperfectly carried out by Wrangel, the commander in the field; but within a short time the Danes had been driven on to the island of Alsen and to surrender.

The following year Moltke outlined the tactics suited to the new breech-loading rifle, which proved so successful in the Seven Weeks' War against Austria, 1866, and the Franco-Prussian War of 1870-71. In both wars Moltke remained at the headquarters of the king, who was c.-in-c. of the army, the command in the field being delegated to three army commanders.

In 1870 Moltke was created a count, and in 1871 he was elected to the Reichstag. He remained in office until 1888, supervising the histories of his campaigns, and died in Berlin, Aug. 24, 1891. See Franco-Prussian War; Seven Weeks' War.

Moltke, HELMUTH JOHANNES LUDWIG VON (1848-1916). German soldier. Nephew of the great von Moltke, he was born at Gersdorff, Mecklenburg-Schwerin, May 23, 1848. He served through the Franco-Prussian War, and was for a time a lecturer in the Military Academy, Berlin. In 1891 he was appointed A.D.C. to William II, and in 1906 became general of infantry and chief of the general staff, thus being the real generalissimo of the German army when the First Great War broke out. Owing to the failure to capture Paris, he was superseded by Falkenhayn in Oct., 1914. He died on June 18, 1916.

Molton, SOUTH. Borough and market town of Devon, England. It stands on the Mole, 12 m. S.E. of Barnstaple. The chief buildings are the fine Perpendicular church of S. Mary Magdalene, the guildhall, and the market house. The town is an agricultural centre, noted for its annual sheep fair held in Aug.; industries include the manufacture of shirts, aprons, etc., tanning, and dry cleaning. It was given a corporation in 1590. It was then and later a centre of the woollen manufacture, while at one time lace also was made

here. At one period it sent two members to parliament. Market days, Thurs. and Sat. Pop. (1951) 3,125. North Molton is a parish and village, 3 m. to the N.E.

Moluccas OR SPICE ISLANDS. Islands of Indonesia. They are Gilolo or Halmahera, Ternate, Tidore, Bachian, Buru, Ceram, Amboyna, and the Banda Islands. The islands coversome 20,000 sq. m. in area, 40,000 sq. m. if adjacent islands are included; est. pop. 893,400. In general they are volcanic; and there are active cones on Ternate, Gilolo, and Banda.

Ternate consists of a peak, 6,000 ft. above sea level, and has the residence of the sultan. Ceram exports sago, Amboyna cloves, and the Banda Islands nutmegs.

The Spice Islands were known by repute long before European ships reached the East Indies, and their native and unique products were articles of trade greatly desired during the Middle Ages, when seasoning was required to make winter meat palatable. Two Portuguese navigators, Serrano and D'Abreu, located them in 1512, and they were Portuguese from 1521 until the natives expelled the traders in 1583. In 1613 the islands were acquired by the Dutch, who held them (except during the years 1810-16 when they were occupied by the British) until 1942. The early Dutch policy was marked by great secrecy; to maintain the monopoly in the supply of cloves, the tree was exterminated in all the islands except Amboyna.

On Jan. 30, 1942, Japanese aircraft bombed Amboyna, the second largest naval and air base in the Netherlands E. Indies, and Japanese troops made a landing, which was strongly opposed by the garrison; but all organised resistance had been overcome by Feb. 7. Halmahera was also seized by the Japanese.

Both Halmahera and Amboyna were attacked repeatedly by Allied aircraft during 1943 and 1944. On Sept. 14, 1944, U.S. troops landed on Morotai, and they were in control of the island by the 17th, the Japanese garrison having fled to the hills. It became an important base for Allied bombers in operations against the Japanese-occupied Philippines and E. Indies. No further major operations were undertaken in the Moluccas, Japanese forces there surrendering at Morotai, Sept. 9, 1945. The Moluccas were recognized by the Netherlands govt. as part of the new state of E. Indonesia, Dec., 1946. See Indonesia.



Count von Moltke,
German soldier

Molybdenite. Chief ore mineral of molybdenum (*v.i.*), molybdenum sulphide, containing up to 60 p.c. of the metal. It generally occurs as soft lead-grey scaly masses. Molybdenite is found in deposits associated with granitic rocks, *e.g.* in granites, granite pegmatites, in siliceous veins formed at a late stage in granite consolidation, and in associated contact-metamorphic deposits.

Molybdenum (Gr. *molybdos*, lead). One of the metallic elements, chemical symbol, Mo; atomic number, 42; atomic weight, 95.95; density, 10.0 gm per c.c.; melting-point about 2,622° C. Silver white in colour, with a strong metallic lustre, it is prepared by heating the chloride or the trioxide to redness in a current of hydrogen.

Molybdenum occurs in nature in various forms, of which two are of commercial importance: the sulphide, MoS₂, known as molybdenite, which somewhat resembles graphite, being a soft, lead-grey mineral with a metallic lustre; and the yellow lead molybdate, PbMoO₄, wulfenite. Among the rarer minerals is molybdenum ochre, MoO₃. Of the world's production, approx. 20,000 tons annually, 90 per cent. comes from the U.S.A. The chief centre is Climax, in Colorado. Smaller producers are in New Mexico, Norway, and French Morocco, while quite a large amount of molybdenite is produced as a by-product from various copper mines. The ore is treated by roasting, which causes the volatilisation of the trioxide, MoO₃, which is condensed in crystal form. The oxide is subsequently reduced with hydrogen to a grey metal powder, which may be pressed into bars, sintered, swaged, and drawn into wire or rolled into sheet. This process does not involve melting the metal, which is difficult due to its high melting point; but a process is in the experimental stage for producing ductile molybdenum by melting in an arc furnace under an atmosphere of hydrogen.

Molybdenum sulphide appears to have been first recognized in 1778 by C. Scheele; and was first isolated by the Danish chemist P. J. Hjelm in 1782. It is quite malleable and softer than steel. Normally unaffected by air, it oxidises rapidly at temperatures above 600° C., but it may be forged and welded at red heat in a protective atmosphere. In the electrical industry, where it



Mombasa, Kenya Colony. Landing place for small steamers and native craft

is nicknamed "Molly," it has a variety of uses, its good conductivity being an asset. In radio valves molybdenum wire is used for winding the controlling grids, and it acts as the support for filaments in incandescent lamps. Molybdenum is used for crucibles and for furnace windings, but for such uses it must be protected from the air either by hydrogen or by a suitable refractory. Its chief use is in the alloy steel industry, where it is sometimes used alone but more commonly in association with nickel and chromium. Here it increases strength at high temperatures and reduces the tendency for temper brittleness. Additions are usually of the order of 0.3 to 1 per cent. and they are made in the form of ferro-molybdenum. The addition of about 0.5 per cent. to cast irons increases their strength. Various non-ferrous alloys are made, such as one containing 60 per cent. of molybdenum, with tungsten, platinum and cupro-nickel, used for tipping fountain pen nibs. Certain molybdates are used in dyeing, to give a blue colour to glazes and pottery and for colouring rubber and leather. See Metallurgy; Steel; Thermionic Valve.

Mombasa. Seaport of Kenya. Built mainly on a coral island (3 m. long by 2 wide, 5½ sq. m. in area) and

connected with the mainland by rly., Mombasa is the principal port on the E. Africa coast. The Old Harbour, on the N.E. of the island, is mainly used by small steamers and native craft (dhows); Kilindini harbour, used by larger ships, is at the S.W. end. A new slipway was opened in 1931, taking ships up to 2,300 tons. Road connexion with the mainland on the N. side of the island was effected in 1931 by the opening of the Nyall Bridge, which is built on pontoons. Fort Jesus, erected by the Portuguese during 1593-95, was the scene of the Arab siege, 1696-97, and is now a prison. Much of the earlier history of the E. coast centres upon Mombasa. Pop. 102,500.

Moment. Term used in mechanics. The moment of a force about a point, or axis, measures the tendency of the force to produce rotation about that point, or axis. The exact measure of this moment is given by the product of the force into the perpendicular distance of the point, or axis, from the line of action of the force. If there are two or more forces, the algebraic sum of their separate moments is the same as the moment of their resultant about the point.

MOMENT OF INERTIA. If the rotation of a body about an axis is to be altered, a moment (or torque, as it is often termed) must be applied about the axis. The acceleration produced by a given torque depends not only on the actual mass of the body but on its distribution with respect to the axis of rotation. If m is the mass of a small body located at a distance r from the axis of rotation, its moment of inertia is given by $I = mr^2$. For an extended body the total moment of inertia will be given by summing up for all the individual particles, thus: $I_{\text{total}} = \sum mr^2$. A table of typical moments of inertia for differently shaped bodies about particular axes is given here:

Body (of mass m)	Axis	Moment of Inertia
Thin ring of radius r	Through centre perpendicular to plane of ring	mr^2
" " " " "	Along any diameter	$\frac{1}{2}mr^2$
Thin disc of radius r	Through centre perpendicular to plane of disc	$\frac{1}{2}mr^2$
" " " " "	Along any diameter	$\frac{1}{4}mr^2$
Uniform thin rod of length $2l$	Perpendicular to rod at centre	$\frac{1}{12}ml^2$
Sphere of radius r	Along any diameter	$\frac{2}{5}mr^2$

MOMENTS AND CENTROID. In plane geometry the moment of a figure about any given line is found by dividing the figure into n small elements, multiplying the area of each element a by its perpendicular distance d from the line, and calculating the limiting value of Σad as n approaches infinity. The second moment is Σad^2 , the third Σad^3 , etc. The centroid is the point whose distance from the line multiplied by the total area of the figure is always equal to the moment of the figure. Similar definitions hold for three-dimensional figures.

MOMENT OF A MAGNET. This is measured by the product of a magnet's pole strength and the distance between the poles.

Momentum. In dynamics, the product of the mass of a moving body and its linear velocity. The term was used by Galileo and Newton, and by the latter's third law of motion the momentum of a body or a system of bodies cannot be changed by the actions of forces between their various parts. This is the principle of the conservation of momentum. The angular momentum of a body is a term used in connexion with rotating bodies, and is the product of the moment of inertia of the body about the axis of rotation and its angular velocity.

Mommsen, THEODOR (1817-1903). A German historian and scholar. He was born at Garding in Slesvig, Nov. 30, 1817, the son of a pastor, and educated at Kiel university. Specialising in the study of antiquities, he spent three years in Italy studying inscriptions. The results of his work brought him wide recognition, and in 1848 he was appointed professor of civil law at Leipzig. This post he lost in 1850 in consequence of expressions of sympathy with the revolutionary party.

Taking refuge in Switzerland, Mommsen was appointed pro-

fessor of Roman law at Zürich. Returning to Germany in 1854, he became prof. of ancient history at Berlin in 1858. In the meantime he had been at work on his Roman History, which appeared during 1854-56. With his professorship was bound up the task of editing the Corpus Inscriptionum, which he had been asked to undertake by the Berlin Academy. He also engaged in an immense amount of other labours, notably a work on Roman coinage, and two others dealing with Roman law. In 1884 appeared his Roman Provinces, the most valuable of all his contributions towards the elucidation of ancient history. During 1873-82 he was a member of the Prussian parliament. He died Nov. 1, 1903. There is a good English translation by W. P. Dickson of the Roman History and the Roman Provinces.

Momus. In Greek mythology the god of jest and mockery. His sarcasm and criticisms became so hurtful to the other gods that he was expelled from heaven. He was the son of Night.

Mona. Name by which the island of Anglesey (*q.v.*) was known to the Romans. The name was also applied, perhaps in error, to the Isle of Man.

Monaco. Principality of S. Europe. Except for the short coast-line on the Mediterranean Sea, this state of 368 acres is entirely bounded by the French dept. of Alpes-Maritimes. Coal and wine are imported in exchange for olive oil, oranges, citrons, and perfumes. The revenue is mainly derived from the gaming tables of Monte Carlo. There are three towns, Monaco, Monte Carlo, and La Condamine. The first contains



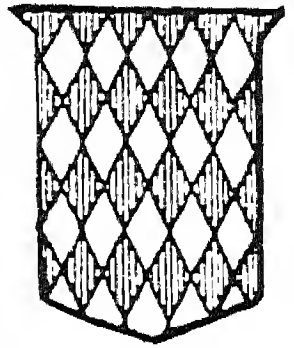
Theodor Mommsen.
German historian

the new Roman-Byzantine cathedral, seat of a bishopric, the palace, and the international hydrographic bureau. Pop. (1956) 20,422.

The family of Grimaldi secured Monaco in 968, and when in 1731 the male line failed it passed to Louise, daughter of Antoine I, and her husband, who assumed the name Grimaldi. Rainier III (b. 1923), who succeeded his grandfather in 1949, in 1956 married the film actress Grace Kelly (*q.v.*). It was French, 1793-1815, and for a few months in 1859-60 belonged to Sardinia. In 1861 it came under French protection. A constitution of 1911 provided for government by a prince and council.

Mona Complex. Two groups of Pre-Cambrian (*q.v.*) rocks found in Anglesey and on the N.W. side of the Llyn Peninsula, Wales. Various members of the complex are intensely folded and highly metamorphosed, but they have been subdivided by Edward Greenly into a lower group of gneisses and an overlying group of sediments and volcanic rocks.

Monad (Gr. *monas*, a unit). Term in various systems of philosophy; also in biology and physics. According to Leibniz (*q.v.*), the founder of the system known as monadology or monadism, every compound can be resolved into elements which he calls monads. These are simple, incorporeal, unextended, intelligent, substantial unities. They are not physical points, like the atoms of Epicurus, but metaphysical points, real forces, not purely passive, like the corporeal elements of Descartes. All that exists results from the association of these monads with a principal monad, whereby is produced a gradation of species, ascending from raw matter to the



Monaco arms



Monaco, South Europe. General view from the town of Monaco, looking east: showing the town of La Condamine, part of Monte Carlo Harbour, and, left, the palace of the Prince of Monaco

vegetable, the animal, the intelligent conscious being, and finally to God, the ultimate reason of things. In ancient philosophy monad signified unity as opposed to duality, and also the number one, to which the Pythagoreans appear to have attributed creative force.

Monagas. State of N. E. Venezuela. It is S. of Sucre, N. of the Orinoco, and W. of the Gulf of Paria and Delta Amacuro; the E. boundary is the Manamo, the most westerly distributary of the Orinoco delta. The W. section of the state is hilly, the E. low-lying. It is well watered, fertile, and contains several lakes. The capital is Maturin. Area, 11,155 sq. m. Pop. 122,901.

Monaghan. Co. of the Irish Republic, in Ulster prov. The surface is undulating, with hills S. and E., and in parts boggy. Chief rivers are the Blackwater, flowing along the N.E. boundary, and the Finn, and there are many small lakes. Oats, flax, and potatoes are grown; cattle, sheep, pigs, and poultry are reared. Coal, limestone, and gypsum are mined on a small scale. The state railway and the Ulster Canal serve the county. Monaghan is the county town; other places are Clones, Carrickmacross, Castleblayney, and Ballybay. Until the reign of Elizabeth I the co. was owned by the MacMahon family; later it was made a shire. Chief antiquities are a Gaelic round tower and the fort at Clones. Three members are elected to the dáil. Area, 498½ sq. m. Pop. (1951) 55,362.

Monaghan. Urban dist. and market and county town of co. Monaghan, Irish Republic. It is on the state rly. and Ulster Canal, 52 m. N.W. of Dublin. The chief buildings are the modern R.C. cathedral, the court house, and others used for public purposes. There are a convent, a college for priests, and three state hospitals. Embroidery and bacon curing are the occupations. Monaghan grew up round a monastery, and was made a corporate town in the 18th century. In the vicinity is Rossmore Park. Market day, Mon. Pop. (1951) 4,725.

Mona Lisa. Name given to a half-length portrait by Leonardo da Vinci now in the Louvre, Paris. The subject was a Florentine lady, Lisa di Anton Maria di Noldo Gherardini, who married Francesco di Bartolommeo del Giocondo in 1495. From her married name the picture is often known as La Gioconda. It is painted in tempera on a panel measuring 2 ft. 6½ ins. by 1 ft. 9

ins., and was probably executed 1503-06. The artist himself held the portrait to be unfinished. It is believed to have been purchased by Francis I of France for 4,000 gold florins. In 1911 it was stolen from the Louvre, but was discovered in Florence and restored to its place in 1913. See Leonardo da Vinci illus.

Mona Monkey. Species of guenon monkey (*Cercopithecus*) found in W. Africa. It is recog-



Mona Monkey. Specimen of the West African species of guenon

nized by its iron-grey body with a vivid chestnut stripe from the middle of the back to the root of the tail, and white chest and throat. The face is purple, the side whiskers yellow. See Guenon.

Monarch (Gr. *monos*, alone; *archein*, to rule). Name for a ruler whose authority is undivided. It originated with the Greeks, who classified states according to their method of government. The word monarchy was used throughout the Middle Ages, and later for the great states in which a single ruler had supreme power, e.g. the Hapsburg monarchy and the French monarchy, and continually appears in treatises on government, e.g. Dante's *De Monarchia*. Today monarch is merely a synonym for an emperor or king who rules by hereditary right as opposed to a president or elected head. Monarchy is absolute when there is no legal check on the power of the ruler, limited when his power is shared by other persons, such as nobles or an elected body, whether they derive their power from custom or from a constitution. See Divine Right; Government; King; Sovereignty; State.

Monarchianism. Name given to a heresy propounded in the 2nd and 3rd centuries by certain Christians, who, under cover of upholding the monarchia, or original oneness and sole government of God, opposed the orthodox doctrine of the Trinity, on the ground that it involved tritheism. This heresy, which was denounced by Justin Martyr (c. 100-165), appears to have been introduced to Christianity by Alexandrian Jews and Gnostics. The heresy was usually presented in one of three forms. The Adoptionist view was that Christ was not essentially and originally divine, but became the Son of God by adoption of the Father; the Dynamistic view was that Christ was a mere man, on whom God the Father conferred divine powers; and the Modalistic view held Christ to be the Father Himself incarnate. See Adoptionism; Sabellianism; Trinity.

Monash, Sir John (1865-1931). Australian soldier and engineer. Born at Melbourne of Jewish parents, June 27, 1865, he graduated at the university and became a civil engineer; a pioneer of reinforced concrete in Australia, he was appointed president of the Victorian engineering institute. He entered the army in 1887. When the First Great War began he was made chief censor, but soon went to Gallipoli in command of the 4th Australian brigade, with which he saw heavy fighting. Proceeding to France, he led the 3rd Australian division with distinction at Messines in 1917. On June 1, 1918, he succeeded Sir William Birdwood as commander of the Australian corps, and was created K.C.B. after the operations of Aug. 8. At the armistice he became director-general of demobilisation in his country, but left the army in 1920 to manage the Morwell Brown coalfield scheme. During 1924-26 he was president of the Australian Association for the Advancement of Science. He died Oct. 8, 1931.



Sir John Monash, Australian soldier and engineer, Bassano, Ltd.

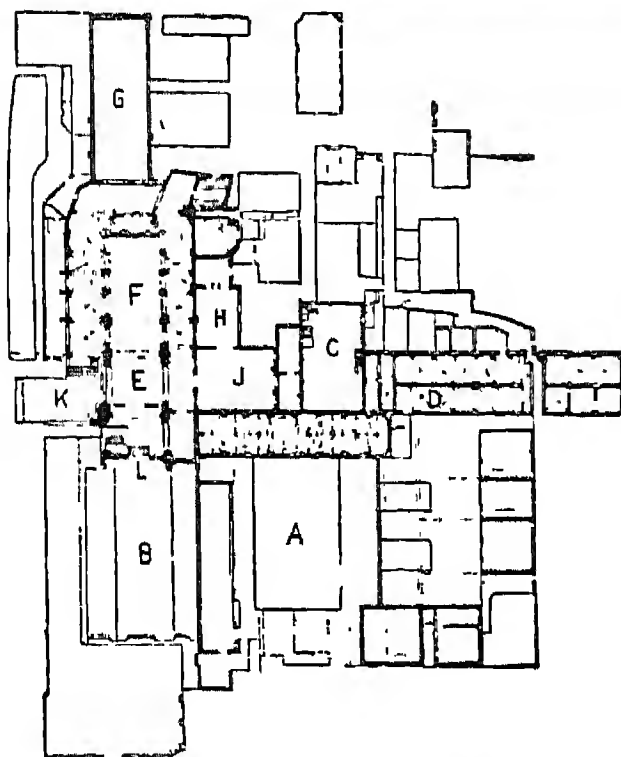
Monasterboice. A village of co. Louth, Irish Republic. It is 5 m. N.W. of Drogheda and is famous for remains of archaeological interest. These include two churches, a round tower 110 ft. high, and three fine crosses.

Monastery (Gr. *monastērion*). House for monks. The term seems at first to have been applied to all religious houses of retirement, whether for men or women; but in course of time, while monks and nuns were housed in abbeys and priories, the former under abbots and priors, and the latter under abbesses and prioresses, it became the custom to call the houses for nuns nunneries or convents, and those for monks monasteries. See Abbey; Convent; Karakoram; Priory.

Monastery, THE. Eleventh of the Waverley novels, published in March, 1820, and the only one to which Scott added a sequel (*The Abbot*). A romance of the monastery of St. Mary's of Kennaquhair (Melrose Abbey), it deals with the family history of the Avenels (the lawless Border baron, Julian; his gentle niece, Lady Alice, and her daughter, Mary) and the Glendinnings (the widowed Elspeth, who shelters Lady Alice and her daughter, and her sons, Edward and Halbert, rivals for the hand of Mary). Euphuism is burlesqued in the character of the fugitive Elizabethan courtier, Sir Piercie Shafton, and the introduction of the supernatural White Lady, guardian spirit of the Avenels, is regarded as a weakness.

Monasticism (Gr. *monastikos*, living alone). System under which persons live who have abandoned the world for a life of religious seclusion. It is more ancient than Christianity, and perhaps is prehistoric. The problem of conformity to the world had become acute, even before the formation of a state Church under Constantine, in 325. Thenceforward a steadily increasing stream of Christians went out to hermit life in the Egyptian deserts. They fled not only from the world, but from a Church which had admitted the world to its bosom. Many of these hermits gradually formed communities under systematic rules, of which S. Basil's is the best known.

Meanwhile the monastic ideal spread to Western Europe, where it found a legislative genius in S. Benedict (d. 542), whose rule either superseded or modified all others. Both Church and State, from different points of view, agreed in ratifying the indelibility of monastic vows. From the "Three Substantials" of poverty, chastity, and obedience not even emperor or pope could grant dispensations. These, under the Benedictine rule, were reinforced by other prescriptions—frequent prayer, manual labour, abstinence from flesh-food, and strict claustration within monastic precincts. The rules of the



Monastery. Plan of the ancient priory of S. Bartholomew, London. A. Cloisters. B. Nave. C. Chapel. D. Refectory. E. Great Tower. F. Choir. G. Prior's house, above which was infirmary and dormitory. H. Chapter House. J. South transept. K. North transept. L. Present entrance to church

regular canons were rather less strict than those of the Benedictines in the matter of food and claustration.

Throughout the Dark Ages the monks did indirectly work of great value as missionaries, sacrificing their ideal of seclusion to the necessities of their fellow-men. School teaching, except to the boys who were being trained for monks, was, however, no part of the monastic ideal at ordinary times and places; the universities owed scarcely anything to the monasteries in their inception; and even the nunnery schools of the later Middle Ages grew up in spite of ecclesiastical prohibitions, and mainly under the pressure of financial causes. The direct services of the monks to medicine and art have been exaggerated. While monasticism was perhaps the greatest social force of the Middle Ages, it cannot be really understood except in reference to its environment; and medieval civilization was still very rudimentary in important particulars.

The 11th and 12th centuries saw a considerable revival of learning and civilization in Europe; and the monastic system was found to need a good deal of reform. Between 1020 and 1120 eight new and stricter orders were founded; of these the most important were the Carthusian, Praemonstratensian, and Cistercian. The last aimed simply at a restoration of the exact Benedictine rule, which had everywhere been relaxed. It owed most of its success to S. Bernard (d. 1152), but, by the end of the century, even this reform had spent most of its force. Then came the great revivals associated with the names of S. Francis (d. 1226)

and S. Dominic (d. 1221). The Franciscans and Dominicans, with the Austin friars and Carmelites, were called Mendicants, as opposed to the older Possessionates or owners of property.

In all orders the *individual* was forbidden to possess property; but whereas, in the older orders, the *corporate* endowments were considerable, the four orders of friars repudiated in theory even corporate possessions. This, however, soon broke down in practice; but, to the very end, the friar differed from the monk in depending to a considerable extent upon alms. The Franciscan revival was certainly the greatest religious movement between the Apostles and the Reformation, and contributed greatly to the advancement of learning. From about 1230 onwards, the friars became for a century the most active and successful of university teachers.

This was the last of the great reforms of the Middle Ages, though much was done at different places to avert decay. The more intimate monastic records, which have only lately been systematically published and studied, show a gradual abandonment, not only in practice, but even in theory, of many of S. Benedict's most important prescriptions. Manual labour was practically dead three centuries before the dissolution in England; the prohibition of flesh-food was whittled away, even with papal sanction; and the rule of claustration was so habitually broken that its re-enactment by Henry VIII has sometimes been spoken of as a piece of intolerable tyranny. For the actual methods of that monarch there is little to be said, but the necessity of the dissolution can be inferred from monastic records themselves, and from the complaints of the most orthodox churchmen. It was not that the monks of 1536 were so much more relaxed than their forefathers for many generations past, but society had begun to outgrow the need for monasticism as a great world institution—a growth which, it must be said, owed much to the civilizing influence of monasticism itself in the past.

Its subsequent history only emphasises the lesson of English history. In France, some of Richelieu's greatest difficulties were with the reform of the monks; and the Revolution swept them away as a state institution, a story which has been repeated in nearly every other European country. That the ideal in itself is healthy is proved by its vitality under voluntarist conditions, and even under

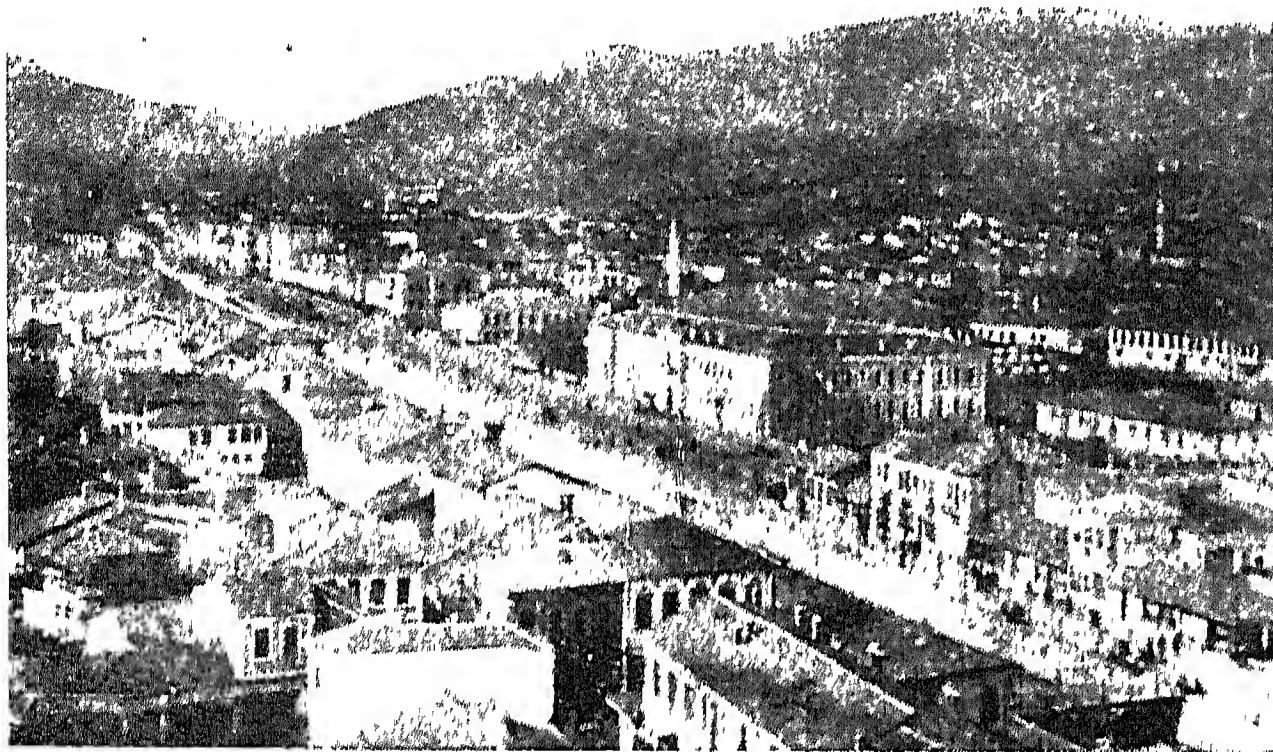
the more definite discouragement of persecution. But no sketch of monasticism can be complete which does not do justice to the unselfish, beneficent work of the individual monk, and to the unanimity with which the modern world has decided against all exceptional privileges for these communities.

G. C. Coulton

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Monastir (Yug. Bitolj or Bitola). Turkish and historic name of a town of Yugoslavia, 130 m. N.W. of Salonica. It was the capital

The Bulgarians took the town in Dec., 1915, during the First Great War; but after the capture of Florina, Sept. 18, 1916, by the Allies, French, Russian, and Serbian troops advanced towards it. The Serbians seized the commanding height of Kaymakchalan on Sept. 30 and pushed on towards the Teherna bend, which they crossed between Oct. 9-17. Meanwhile the French and Russians unsuccessfully assaulted the Kenali line. The Serbs drove the Bulgarians from the Chuke heights on Nov. 10 and took Tepavei, Nov. 13-14, outflanking the Kenali position. The Bulgarians withdrew to the Bistritza; and the Serbs, advancing in the mountains, outflanked Monastir itself. The Bulgarians hastily evacuated the town, which was occupied by the French, Nov. 19.



Monastir, Yugoslavia. General view of the Serbian town, the scene of much fighting in the Balkan War of 1912 and important in both Great Wars

of a vilayet of the same name while Macedonia was under Turkish rule, and was of importance both militarily and commercially. It was a Turkish depot, had manufactures of leather and carpets, and exported grain. Pop. 33,024.

During the course of the Balkan war of 1912 the main Serbian army, after its victory over the Turks at Kumanovo, Oct. 23-24, advanced towards Monastir. The Turks took up a strong position N. of the town on a front of 16 m., which the Serbs attacked on Nov. 15, making a successful assault on the Turkish left wing the next day. A Turkish counter-attack was repulsed on Nov. 17, and a general attack by the Serbs on Nov. 18 drove in the centre of the Turks, who broke and fled, the victors entering Monastir. By the treaty of Bukarest, 1913, it was allotted to Serbia.

In the Second Great War the Germans captured Monastir on April 10, 1941, and by their occupation of this strategic point brought overwhelming forces to bear upon the Greek army fighting the Italians in Albania. It was liberated by the Yugoslav patriot forces on Nov. 6, 1944.

Monazite. Mineral of complex composition. It is essentially cerium phosphate but containing also variable amounts of the "rare-earth" elements, thorium, and the radio-active element mesothorium. Monazite is the principal source of cerium, lanthanum, neodymium, praseodymium, and thorium, which have uses in the manufacture of lighter flints (cerium), gas mantles (thorium), in atomic energy investigations (thorium), and cerium salts have application in medicine, ceramics, tanning, dyeing, and optical

glasses. Monazite is a greenish-yellow to brown mineral occurring in residual deposits formed by the weathering of granitic rocks. Commercial deposits are found in India at Travancore, in Brazil, Indonesia, and the U.S.A.; unworked deposits occur in Australia, Nigeria, Nyasaland, and Norway.

Monboddo, JAMES BURNETT, LORD (1714-99). Scottish lawyer. He was born at Monboddo, Kincardineshire, and educated at Aberdeen and Edinburgh. He rapidly acquired distinction at the bar, and in 1767 became a lord of session. Far in



Lord Monboddo, Scottish lawyer

advance of his age, he studied the origins of mankind from a new standpoint, and enunciated his views boldly in *The Origin and Progress of Language*, 1773, and *Ancient Metaphysics*, 1779-99. Lord Monboddo died May 26, 1799. He is best remembered from frequent allusions to his theories made in Boswell's *Life of Johnson*.

Moncalieri. Town of Italy, in the prov. of Turin. It stands on the river Po, 5 m. by rly. S. of the city of Turin. On a height above the town is a royal palace dating from 1470, rebuilt in the 17th century, containing a series of pictures illustrating the story of the house of Savoy. Pop. (1951) 26,097.

Mönch (Ger., Monk). Mt. peak of Switzerland, in the Bernese Oberland. It rises between the



Mönch Switzerland. The snow-clad peak in the Bernese Oberland seen from Interlaken

Eiger and the Jungfrau, has an alt. of 13,468 ft., and is covered with snow and ice fields. The first ascent was accomplished by Porges in 1857. *See Eiger.*

Monchique. Town of Portugal, in the dist. of Faro and the prov. of Algarve. It is 12 m. by road N. of Villa Nova de Portimão and 13 m. S. of the station on the Lisbon rly. Beautifully situated on a spur of the Serra de Monchique, alt. 1,476 ft., it is a noted health resort. There is a trade in wine, olive oil, oranges, etc. At Caldas de Monchique, 5 m. to the S., are hot sulphur springs used for skin diseases. Pop. 8,000.

Monchiquite. Fine-grained igneous rock of the lamprophyre (*q.v.*) group, named after the Serra de Monchique (*v.s.*). It consists chiefly of olivine and purplish augite.

Monck, CHARLES STANLEY MONCK, 4TH VISCOUNT (1819-94). British administrator. Born at



4th Viscount Monck, British administrator

Templemore, Tipperary, Oct. 10, 1819, the eldest son of the 3rd viscount, he was educated at Trinity College, Dublin, and became a barrister. In 1849 he succeeded to the Irish title, and in 1852 became M.P. for Portsmouth, being a lord of the treasury, 1855-58. In 1861 he became governor of Upper and Lower Canada, and in 1867-68 was the first governor-general of the new dominion. He was made a baron in 1866. He died Nov. 29, 1894, his elder son succeeding to the peerage.

Monckton, LIONEL (1862-1924). British composer. Educated at Charterhouse, he became one of the most popular of musical-comedy composers, and collaborated with Ivan Caryll in a series of light-hearted musical pieces at the Gaiety, *e.g.* *The Shop Girl*, 1894; *The Circus Girl*, 1896; *The Orchid*, 1903; *The Girls of Gottenberg*, 1907; *Our Miss Gibbs*, 1909. His greatest successes were *The Arcadians* (with Howard Talbot), 1909, and *The Quaker Girl*, 1910. He died Feb. 15, 1924. He married the actress Gertie Millar (*q.v.*).

Monckton of Brenchley, SIR WALTER TURNER MONCKTON, VISCOUNT (b. 1891). British lawyer, born at Plaxtol, Kent, Jan. 17, 1891, and educated at Harrow and at Balliol, Oxford.



Viscount Monckton, British lawyer

of the council. During the Second Great War he was director-general of the ministry of Information, going to Cairo in 1941 as head of the propaganda and information services. He was attorney-general May-July, 1945; minister of Labour 1951-55; minister of Defence 1955-56. Made K.C.V.O. 1937, K.C.M.G. 1945, he was created a viscount 1957.

Moncton. City and port of entry of New Brunswick, Canada. It stands on the Petitcodiac river, 90 m. from St. John and 650 from Montreal. It is a divisional point of the national railway system, which has workshops here. There is a good harbour, and the town has manufactures of machinery, lumber mills, etc. Pop. 22,763.

Mond, LUDWIG (1839-1909). Anglo-German chemist. Born at Cassel, Germany, March 7, 1839, and educated at Marburg and Heidelberg universities, he came to England in 1862 to introduce a process for the recovery of sulphur from alkali waste. In 1873, in partnership with Sir John Brunner, he erected works near Northwich for the manufacture of soda by the Solvay or ammonia process. Mond also discovered a method of recovering nickel from low-grade ores. In 1896 he founded the Davy-Faraday Research Laboratory in connexion with the Royal Institution, London. He became a naturalised British subject in 1867, and died in London Dec. 11, 1909. His son, Alfred Mond, became Lord Melchett (*q.v.*). *See Brunner, Sir John; Soda.*



Ludwig Mond, German-born chemist Elliott & Fry

Monday. Second day of the week. The word comes from A.S. *Monandaeg* (moon's day) and corresponds to the Lat. *Dies Lunae*, cf. Fr. *lundi*. The name Black Monday was originally given to Easter Monday, April 14, 1360, from the darkness and cold

He was called to the bar in 1919 and was Recorder of Hythe, 1930-37. In 1932 Monckton became attorney-general to the duchy of Lancaster and a member

experienced by Edward III of England when lying with his host before Paris. In the north of England the day before Shrove Tuesday is called Collop Monday, from the collops then eaten. The expressions "Cobbler's Monday" and "Saint Monday" in the sense of a holiday are, perhaps, attributable to the old story of the cobblers who, knowing only that their patron saint's day fell on a Monday, made sure of not missing it by keeping every Monday a holiday. Plough Monday is the Monday after Epiphany, when formerly the ploughmen went round with collecting boxes.

Mondego. River of Portugal. It rises in the Serra de Estrella, and flows first N.E. and then S.W. past Coimbra to the Atlantic Ocean at Figueira da Foz. Length 130 m. Mondego Bay was the spot at which Wellington (then Wellesley) landed on Aug. 5, 1808.

Mondoñedo. City of Spain, in the prov. of Lugo. It stands on the river Masma, 12 m. S. of the coast of the Bay of Biscay and 28 m. N. of Lugo. A bishopric from the 12th century, its cathedral dates only from the 17th. Its Franciscan monastery is now used as a public school and theatre. Captured from the Moors in 858, it was taken by the French 1809. Pop. (1950) 8,533.

Mondovi (anc. Mons Vici). City of Italy, in the prov. of Cuneo. Situated on the N. slopes of the Ligurian Alps, near the river Ellero, 17 m. E. of Cuneo, it consists of an upper town, alt. 1,835 ft., and a lower town, alt. 1,282 ft. It has a 16th-century citadel, a cathedral, and a bishop's palace. The church of S. Maria Maggiore and the chapel of S. Rocco were damaged in the Second Great War. Industries include tanning and the manufacture of textiles, pottery, paper, majolica, and machinery. Mondovi was the seat of the Mons Regalis printing press, established in 1472. Here, on April 21, 1796, the French gained a victory over the Sardinians. Population (1951) 20,429.

Mondrian, PIETER CORNELIS (1872-1944). A Dutch painter. Born March 7, 1872, at Amersfoort, he studied at Amsterdam academy of fine arts and began to paint landscapes which emphasised mass and eliminated detail. In Paris, influenced by the Cubists, he became so ascetic that he found curves too emotional, and concentrated on horizontal and verti-



Mondoñedo arms

cal lines, convinced that the right angle was the purest "expression of the two opposing forces which constitute life." A pioneer of abstractionism, he went in 1940 to the U.S.A., and there died, Feb. 1, 1944.

Monel Metal. Important alloy of copper and nickel. It varies slightly in composition, as it is often made directly from ores containing both nickel and copper; a typical composition would be 68 p.c. nickel, 20 p.c. copper, 2 p.c. iron. Such an alloy would have an ultimate tensile strength of about 37 tons per sq. in. with an elongation of 40 p.c. Malleable in the cold, with high resistance to corrosion, while it retains its strength at high temperatures, the alloy is used for turbine blades, valve parts, etc.

Monet, CLAUDE OSCAR (1840-1926). French painter, born in Paris, Nov. 14, 1840. He received his first instruction from Boudin, whom he met in 1855, and in 1862 he entered Gleyre's studio. In 1863 he came into contact with Manet's work, and was



Claude O. Monet.
French painter

greatly influenced by his new method of painting in bright colours laid on in separate tones. He adopted the method, incorporating with it the results of his own scientific study of light, and was joined by Pissarro, Sisley, Renoir, etc., the group becoming known as the Impressionists. Monet was the real founder of Impressionism.

Among his first pictures were *Déjeuner dans un intérieur*, 1868; and figure pictures, *Camille*, 1866; and *La Japonaise*. He went to live by the Seine, at Argenteuil, Vétheuil, and Giverny, and painted the river in all its moods, and in 1871 he visited England to study the Thames, of which, however, his chief pictures were painted during a later visit, 1901-04. He devoted himself to portraying the sea and rocks on the Mediterranean coast, 1884, and at Belle-Île, 1886. His fame rests chiefly on his three series of pictures of one subject under varying effects of light and atmosphere, e.g. *The Haystacks*, 1890-91. His stated view that the principal "person" in any picture was light represented a revolutionary attitude to painting, and

was widely quoted by admirers of the Impressionists. In his old age he painted studies of his beautiful garden at Giverny, with its famous lily pond. He died Dec. 5, 1926. See illus. under Impressionism. Consult Claude Monet, X. Lathom, 1931; C.M. and his Garden, S. Gwynn, 1934.

Moneta, ERNESTO TEODORO (1833-1918). Italian publicist. Born at Milan, Sept. 20, 1833, he served with Garibaldi, and was in the Italian army, 1861-67. He edited *La Libera Parola*, 1860-61, and was director of *Il Secolo*, 1867-96. In later life he devoted himself to the propagation of peace, and presided at the Milan international congress of 1906. In 1907 he was awarded the Nobel peace prize, but he was a warm supporter of Italy's participation in the First Great War. He died Feb. 10, 1918.



Ernesto T. Moneta,
Italian publicist

Money (Lat. *moneta*, mint). Name for whatever is commonly used within a community as a medium of exchange. The introduction of money marked a big social advance on the older method of exchange by barter. In the past money has taken the form of furs, skins, salt, shells, and various metals in their rough form. Coins were a development from the use of metals. The use of paper (notes) and of cheques drawn on banks came with the growth of credit.

At the present time coins and notes (cash) form that section of money used for most retail purchasing, for casual expenditure, and for payment of wages. For larger transactions, cheques are commonly used; and these, though usually covered by money due to the drawer by his bank, may be covered by an overdraft or a loan to him from his bank made against suitable security. Since they serve for the purchase of goods and services, bank loans and overdrafts must be regarded as money. Most economists exclude from that term, however, such bank deposits as are in the nature of permanent or semi-permanent savings, preferring to consider these as investment.

The amount of money is never static; it can be increased or decreased at will, as, indeed, it must be if the constant fluctuations in the volume of trade

being conducted from moment to moment are to be adequately served. Good trade prospects lead to increased employment, the encouragement of overtime, and the offer of higher wages for increased output, all of which mean larger demands for cash upon the banks from employers, to meet which the banks draw more cash from the accounts they keep with the Bank of England, so that the total of notes and coins in circulation rises. Good prospects also affect credit money, consisting of bank deposits and overdrafts, for employers need not only more men, but also more machinery and raw materials, more goods in process of manufacture, and larger factories and shops. They therefore arrange for bank loans and overdrafts, and the cheques they issue against these, when paid into the accounts of those to whom they are given, go to swell the total of bank deposits, so that both the elements in credit money rise at the same time. The reverse process is equally automatic when trade prospects deteriorate.

Artificially created changes in the volume of money, particularly credit money, can also be used to stimulate or restrict trading activity. The Bank of England can, by operations through the London money market, increase or decrease the total of the balances it holds belonging to the commercial banks, and by this action it either encourages them to lend more freely or decreases their power to sustain the volume of loans and overdrafts actually current. Adjustment of the weight of taxation, not according to the size of the current national budget, but according to the outlook for trade, serves similar purposes; thus if, when trade is poor, taxation be reduced even below budget needs, the extra money left in the hands of taxpayers, being spent on goods and services, acts as a stimulus to trade; while extra taxation imposed during times of prosperity has little adverse effect.

Money as a measure of value is neither static nor absolute, but rather relative. A yard of cloth is at all times 36 ins., but a pound's worth of that material may consist of 36 ins. at one time, 30 ins. at another. Such a variation, in either direction, may take place within a relatively short time so that, e.g. goods which cost 16s. 8d. in one year may cost £1 the next. This can be described either as a general depreciation in the purchasing power of money or as a

general rise in the level of prices. Widespread change in prices is due to changes in availability of goods and services and/or the amount of money available and being spent. Particular rises in price occur through scarcity of particular articles, particular falls through plenty. But whether the change is general or particular, the usefulness of money as a measure of relative value, between different commodities, between commodities and services, and between one period and another, remains.

The price of goods and services must not, however, be confused with the price of money. The price of an article is the amount of money which at a particular moment will pay for it; the price of £100 is the amount of money which is generally paid for the use of £100 for a period of one year, *i.e.* the current rate of interest charged for money on loan; and there is no necessary equilibrium between this and prices in general. In fact, other things being equal, the price of money is likely to be low when prices of commodities are high, for the volume of money available for lending may force interest rates down, while, from the same cause, prices are forced up. Where output of goods can be expanded, cheap money is likely to stimulate expansion, for to borrow is profitable; while where the volume of goods and services can be maintained at a level equal to demand, cheap money is likely to reduce the general level of prices because it tends to lower production costs.

In the U.K. the interest rate charged by the Bank of England and the rate fixed for current borrowing by the Treasury are the chief factors determining the general level of interest rates. It has become the aim of government financial policy so to adjust both the volume of money and its price that the national economic machine shall be maintained at maximum output, *i.e.* that demand shall at all times be sufficient to support full employment of both man-power and technical capacity. To attain the highest possible standard of living it is necessary that, by every means of technical equipment and skill, the output of every man is at the maximum. From savings comes capital, in the form of machinery, factories, transport, etc. So far as the saver is concerned, his savings represent deferred purchasing power, but, collected and accumulated through the financial channels maintained

for the purpose, they are used to provide the capital goods without which industrial output would be very narrowly limited. Such investment would, however, be impossible without the money put by by a multitude of individuals as a future claim on production. Money is thus seen to constitute a vital factor in economic development. See Barter; Bill of Exchange; Cheque; Exchange, etc.

Money, SIR LEO GEORGE CHIOZZA (1870–1944). British economist and politician. Born at Genoa, June 13, 1870, of mixed Italian and English parentage, he settled in England, and in 1903 assumed the surname of Money. He was a Liberal M.P. for North Paddington, 1906–10, and for East Northants, 1910–18; later he joined the Labour party, but did not secure election. He was knighted for his services as parliamentary private secretary to Lloyd George, then minister of Munitions, 1915; from 1916 to 1918 he was parliamentary secretary to the ministries of Pensions and of Shipping, and chairman of the National Maritime Board, 1917–18. He died Sept. 25, 1944. His books include *Riches and Poverty*, 1905; *The Nation's Wealth*, 1914; *The Triumph of Nationalisation*, 1920; *Can War Be Averted?*, 1931; *Product Money*, 1933; and several books of verse. He edited the economic, financial, industrial, engineering, and sociological sections of the 1929 edition of the *Encyclopaedia Britannica*.

Money Bill. Any proposal put before parliament which involves the expenditure of public money. The rules and procedure for the passage of such measures into law differ from those of ordinary bills thus: (1) They must be introduced by a minister of the crown; no private member can introduce one. The reason for this is that ministers are responsible for finding the necessary money, and their arrangements would be upset if they had to find sums which were no part of their plans. (2) They can only originate in the house of commons. By resolutions of 1678 and 1860 the commons established the sole right of introducing and altering money bills, and this was strengthened by the Parliament Act of 1911. (3) By the Parliament Act the house of lords was deprived of the right of rejecting money bills, its only remaining power over them. Disputes as to whether a certain measure is or is not a money bill are now avoided by a defining clause in the Parlia-

ment Act which leaves the decision in the hands of the Speaker. See Parliament Act.

Moneylender. One who lends money, but especially one who does so for a livelihood. In the U.K., as in other countries, special legislation has been found necessary for the protection of the public against moneylenders. By the Moneylenders Act of 1900 a moneylender is defined as a person whose business is that of lending money, or "who advertises or announces himself or holds himself out in any way as carrying on that business." Pawnbrokers, bankers, insurance companies, friendly societies, building societies, loan societies, and persons or corporations who lend money merely incidentally for business purposes are excepted.

Every moneylender must annually obtain a certificate from the local police court. He also requires an annual licence from the Customs and Excise, but this is granted automatically on production of his certificate and payment of £15. A moneylender can carry on business only in the name and address authorised in his certificate. Contracts for the payment of money lent by him are unenforceable unless the terms are set out in a writing signed by the borrower, which shows what rate of interest is being charged. A copy must be given to the borrower within 7 days. The court will always re-open a transaction between moneylender and borrower if they consider the interest is excessive and the transaction is harsh and unconscionable. Interest in excess of 48 p.c. per annum is presumed to be excessive unless the contrary is proved. No charge may be made for costs or expenses. Nor may a moneylender send an advertising circular to anyone except on a written request. He may advertise in a newspaper or periodical or by poster at his address, but the advertisement must contain only his name and the address where he carries on business with any telegraphic address and telephone number, any former address, a statement that he lends money with or without security, the highest and lowest sums he lends, and the date when his business was established. He must not employ canvassers. A moneylender cannot sue for money due to him on a loan unless he begins his action within 12 months of his right to sue, according to any written acknowledgement or part payment by the debtor.

Money Market. General term for the whole financial organization concerned with the provision and employment of money available for use for short periods only. In London there is no particular building or exchange devoted to such operations, but the offices of the institutions and firms concerned are for the most part centred around Lombard Street, Threadneedle Street, Bishopsgate, and other adjoining streets within the City area. Nor, strictly speaking, is the money bought and sold—it is rather borrowed and lent, and the prices quoted are rates of interest charged for its use. In one important section, however, the dealings concern the purchase and sale of bills and therein the instrument involved passes from seller to buyer at a discount. Thus, loan rates may, for example, be given as Day to Day $\frac{1}{2}$ to $\frac{3}{4}$, meaning that money loaned on a day-to-day basis could be borrowed at from 10s. to 15s. per cent per annum, while the fine trade discount rate for 3 months being quoted at 1 to $1\frac{1}{2}$, would indicate that such a bill could be purchased at a discount of from £1 to 30s. per cent per annum.

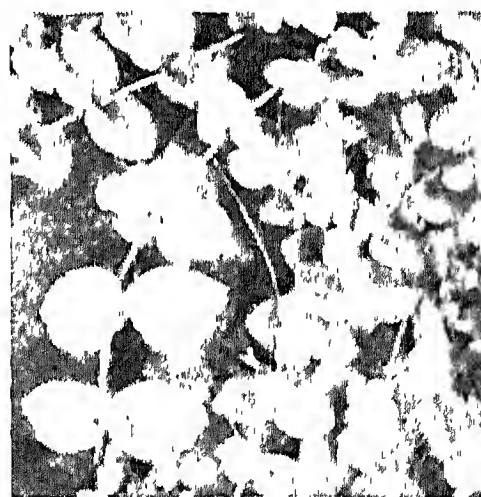
Banks and Discount Houses

The pivot of the market is the Bank of England, exercising a controlling function as agent of the Treasury, and the principal institutions with short-term money to lend or invest in this market are the British banks and those Empire and foreign banks having London offices. To a lesser but important extent, the discount houses supplement the funds of the banks, and many hundreds of millions of pounds are constantly available to borrowers. The chief of these are the British government, the largest English city authorities, the stock exchange, and the discount houses themselves. The latter have, and use, substantial funds of their own, but so large are their operations that they also re-borrow heavily on the bills they have discounted for traders and others needing immediate cash in exchange. These bills arise from both home and foreign trade, and an important source of the latter is a specialised, subsidiary section of the market comprised of the acceptance houses or merchant bankers. Constantly linking buyers and sellers are the body of other specialists called bill brokers, whose function it is to negotiate the dealings between the lending banks and the discount houses. Although both foreign

money (from overseas banks) and foreign bills had, even by 1946, commenced once more to flow to the London money market, the discount houses' operations were still, as throughout the latter years of the Second Great War, concerned largely with short-term government bonds, as a result of which they contributed to the maintenance of cheap borrowing by the state.

Money Order. Document issued at certain post offices to enable a person to send money to someone else. When the money is paid in, the names of the payer and of the payee are taken down, and are sent to the particular office at which the order is made payable; without this advice the money will not be paid. Money orders are thus different from postal orders, which can be transferred like cash. The highest amount for which a money order is issued in the U.K. is £40, and the charge varies from 4d. to 1s. Money orders can be sent by telegraph, and can, like cheques, be crossed for greater security.

Moneywort OR CREEPING JENNY (*Lysimachia nummularia*). Perennial creeping herb of the family Primulaceae, native of Europe. Its prostrate stems creep to a length of about two ft., and bear roundish heart-shaped leaves in pairs, and cup-shaped, solitary yellow flowers. A species often confused with it is the yellow pimpernel (*L. nemorum*), with shorter stems, yellow green larger leaves, and smaller flowers.



Moneywort. Flowering stems of this creeping herb

Monfalcone. Town of Italy. It is 10 m. S.W. of Gorizia and 16 m. N.W. of Trieste, near the Adriatic, is noted for its mineral waters, and was prominent during the First Great War, being taken from the Austrians and then lost by the Italians. It passed to Italy under the peace treaty, July 16, 1920. During the Second Great War, New Zealanders advancing on Trieste made their first contact with Yugoslav partisans of Tito's forces here, May 1, 1945. Pop. 10,000. See Caporetto, Battle of; Gorizia; Italy.

Monforte de Lemos. Town of Spain, in the prov. of Lugo. It stands on the river Cabe, and is a junction on the rly. from Leon, 148 m. to the E., to Corunna and Vigo. It has ruins of a medieval castle, a Benedictine monastery,

now utilised as a hospital, a fine Renaissance church, and a Jesuit college. Chocolate and linen are manufactured, and there is trade in timber and cattle. Pop. 16,000.

Monge, GASPARD (1746–1818). French mathematician. He was born at Beaune, May 10, 1746, and educated at Lyons, where at the age of 16 he became teacher of physics. In 1768 he was appointed professor of mathematics and in 1771, of physics at the military school of engineering at Mezières. In 1783 he moved to Paris, and became examiner of naval pupils. Here he wrote his *Traité Élémentaire de la Statique*, 1786. He was minister of marine 1792–93.



Gaspard Monge, French mathematician

After a visit to Italy in 1796 to receive the Napoleonic plunder of antiquities and *objets d'art*, he accompanied Bonaparte to Egypt and Syria. In 1805 he was made a senator and Comte de Pelouse, but lost both dignities on the Restoration. He died July 28, 1818.

Monghyr. Dist. and town of India, in the Bhagalpur div. of the state of Bihar. The dist. is a low-lying alluvial tract drained by the Ganges. Nearly half the cultivated area yields two crops annually.

Rice, maize, and tobacco are the most important. The town is an important trading centre on the right bank of the Ganges, here crossed by the rly., and opposite the entry of the Burh Gandak river, and contains an up-to-date printing press and cigarette factory, which works the increasing supplies of locally grown tobacco. From the 12th to the 18th century it was a Mahomedan stronghold. Area, 3,975 sq. m. Pop., dist. 2,504,544, town, 63,114.

Mongol. Name denoting a racial stock in Mongolia, with offshoots in the Manchurian Amur province and in Chinese Turkistan. Estimated at 1,800,000, they form, with the Turkic and Tungus stocks the round-headed Altaian branch of the straight-haired yellow race. The coarse, black hair is scanty except on the scalp. The character-

istic Mongolian fold of skin over the inner angle of the eyelids, and the lifted outer angle, produce the well-known slant-eyed effect.

Sturdy, flat-faced, with prominent cheek-bones, they comprise W. Mongols (Eleuts) or Kalmucks; E. Monguls, including the six inner leagues, the Chakhar, and the outer Khalkas; and the central Mongols or Buriat who are much Siberianised. Nomad tent-dwelling hunters and herdsmen, essentially shamanist, they possessed formerly a tribal vigour that has been sapped by lamaism; the Aimak and Hazara of Afghan Turkistan are Muslims.

Cradled in the upper Amur basin, the Mongols shared in the political confederacies which dominated Central Asia for centuries and, under Jenghiz Khan and his successors, extended the 13th-century empire of Tartary from the Dnieper to the Pacific. Under Kublai Khan a Mongol dynasty which lasted during 1279-1368 was imposed upon China. Their Altaic language was written in syllabic signs resembling knots on the left of a vertical stem, based upon Uiguric, and introduced in 1240, until an alphabet adapted from that of the Russian language came into use in 1946.

In various forms—Mongolian, Mongoloid—the term also designates all the yellow-skinned peoples, one of the three primary divisions of mankind. In this sense it embraces numerous very mixed stocks with marked linguistic differentiation. Thus the northern Mongols include, with the Altaians, the Koreans and Japanese, the Finno-Ugrians, the Palaesiatic or E. Siberians, and more remotely the Eskimos and American Indians. The southern Mongols comprise the Tibetan, Chinese, and Indo-Chinese peoples, and more remotely the Malays.

Mongolia. Area of E. central Asia. Including the Gobi desert, 3,000 ft. above the sea, it forms an intermediate region between the Tibetan plateau and the Arctic lowland of Siberia. In winter the cold is intense; in the summer the slight rains produce pasture and fodder shrubs for the sheep, goats, horses, and camels of the nomadic part of the inhabitants, the Mongols proper, among whom Buddhist lamaism is the predominant religion. The chief rivers are the Irtysh, Selenga, and Orkhon, of which the last two are navigable.

Mongolia is divided into Inner and Outer Mongolia. Inner Mon-

golia became in 1947 an autonomous region of China. As reorganized by the Communist govt. in 1950, it gained an area formerly constituting the Manchurian provinces of Hsingan and Liaopei, and lost the provinces of Ningsia and Suiyuan. Suiyuan was restored to Inner Mongolia in 1954; and part of Jehol province was added to the region in 1955.

Inner Mongolia is bounded on the north by Outer Mongolia (*v.i.*); on the east by the Manchurian provinces of Heilungkiang and Kirin; elsewhere by China proper. The capital, formerly Ulan Hoto, was moved to Huhehot (Chinese Kweisui) in 1952. The Chinese Changchun rly., connecting the Trans-Siberian rly. with Manchuria, and also with the railway system of China proper, crosses the region in the north. Area 900,000 square miles. Population (1953) 6,100,104.

Outer Mongolia, bounded in the N. by the R.S.F.S.R. (Siberia), elsewhere by Chinese territory, was also formerly under Chinese suzerainty. Given autonomy at the time of the revolution of 1911-12, it adopted the soviet system of govt. in 1924. All ties with China were severed after a plebiscite held in 1945, and China recognized the area as the independent Mongolian People's Republic in 1946.

Area 625,000 sq. m. Pop. (1954 est.) 740,000, most of them nomadic herdsmen dependent upon their flocks and herds for all the necessities of a hard life. Gold is found, and coal is worked. Wool, skins, and furs are exported, chiefly to Russia. There is a hydro-electric power station at Ulan Bator (Urga), the capital, which stands on the Tola river, a tributary of the Orkhon. Buddhist lamaism is the prevailing religion.

The republic has a parliament, the Great Huruldan, elected by universal suffrage granted at the age of 18; it appoints the 30 members of the presidium or Little Huruldan. Ulan Bator, with a pop. of 100,000, has a university with 1,100 pupils, and staffed by some 70 teachers (half of whom are Russians). It is linked with the Buriat-Mongol A.S.S.R. by rly., to Kiakhta, and, by air, to Ulan Ude. There is connexion by air also with Peking.

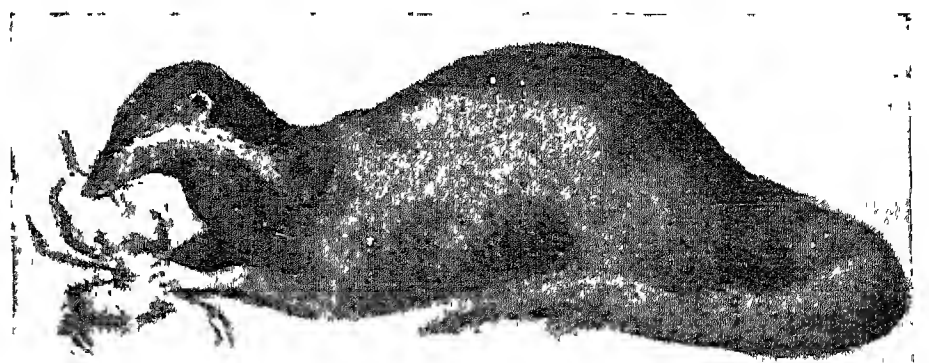
In addition to Ulan Bator University, there were in 1955 in

Outer Mongolia 430 elementary and secondary schools, 15 technical schools, and four institutions of higher education, with a total of 80,000 pupils. An academy of sciences was founded in 1953.

Mongolism. Form of mental deficiency with physical characteristics (round head, oblique eyes, flat nose, squat figure) resembling those of the Mongolian peoples. See Idiocy.

Mongoose. Small carnivorous mammal of the family Herpestidae which includes the civet-cats, and is restricted to the Old World. More closely allied to the ichneumon, the Indian mongoose (*Herpestes nyula*) is a smaller animal with greyish fur and long bushy tail. It is famous for the prowess it displays in destroying snakes, even the deadly cobra failing to use its natural defence against an enemy so agile.

Mongu. Settlement of Northern Rhodesia, the residence of the commissioner for the Barotseland protectorate. It lies in a plain 7 m. E. of the Zambezi river, and of Lealui, residence of the para-



Mongoose. Specimen of *Herpestes urva*, a species which lives on crabs and shell-fish

mount chief of the Barotse. It is connected by railway with Lusaka, 340 m. to the E., seat of government of Northern Rhodesia and Nyasaland. There is road and river connexion with Livingstone, the old capital, 255 m. to the S.E.

Monica (322-387). Saint and mother of S. Augustine of Hippo (mod. Bône, Algeria). Born of pious parents in good circumstances, she was married when very young to Patricius, who became converted through her good example. She had two sons, one of whom, famous as S. Augustine (*q.v.*), always attributed his conversion to her prayers.

Monier-Williams, SIR MONIER (1819-99). British Orientalist. He was born at Bombay Nov. 12, 1819, came to England when a child, and was educated at King's College, London, and Balliol College, Oxford. He passed the entrance examination of the East India co. in 1840, but instead of going E. returned to Oxford and took up the study of Sanskrit, and

during 1844-58 was professor of Oriental languages at the East India College, Haileybury, then was Boden professor of Sanskrit at Oxford, where the Indian Institute was found 1883, mainly at his instigation. Knighted in 1886, he died April 11, 1899. He published Hinduism, 1877; Buddhism, 1889; Brahmanism, 1891; Sanskrit-English Dictionary, 2nd ed. 1899.

Monifieth. A police burgh of Angus, Scotland. It stands on the N. side of the Firth of Tay, 6 m. E. of Dundee, and has a rly. station. Rugs and carpets are woven, and machinery is manufactured. The place has the amenities of a seaside resort and two golf courses. Pop. (1951) 3,419.

Monism (Gr. *monos*, alone, single). Theory which refers all the phenomena of the universe to a single principle, whatever this principle may be. Thus materialists, pantheists, idealists, hylozoists are all monists. Monism is thus opposed to duality and plurality. While forced to acknowledge the existence of contraries (body and soul, mind and matter) it attempts to remove them by explaining them as modifications of a single fundamental principle. Thus, mind and matter and their phenomena are manifestations of some one substance which is neither.

The term monism is also applied to that view of the world which, denying anything transcendent (beyond the material universe), regards the world as a connected whole varying in accordance with fixed laws inherent in itself, to which even man is subject.

Monitor (Lat., one who warns). Term applied to a senior pupil in a school selected to supervise junior pupils in the absence of a teacher. The feminine form is monitress. In zoology a genus of lizards peculiar to the Old World has received the name of monitor from a notion that they give warning by hissing of the approach of a crocodile. A special type of small warship, carrying one or two powerful guns and having a shallow draught is called a monitor. Fire brigades sometimes use a device called a monitor to control the nozzle of a hose when the pressure of water is such that it cannot be directed by one man.

From the outset of the Second Great War men and women were employed by most belligerent countries to listen systematically to radio broadcasts put out by their enemies and by neutral

countries; in Great Britain these people were called monitors, and their work monitoring.

Monitor (*Varanus*). Genus of large lizards of the family Varanidae. Including about 30 species, they are found in Africa, S. Asia, Australasia, and Oceania. Distinguished from other lizards by their long forked tongue which retracts into a basal sheath, as in the snakes, they are long in the body, have no dorsal crest, are thickly covered with small scales, and some attain a length of over 8 ft. In colour they range from blackish to greenish brown and grey. Most live in burrows near water, and are carnivorous, eating birds, small mammals, eggs, and frogs. Monitors swim well with the aid of their long and powerful tails, used also as a weapon of defence. They are eaten as human food in some localities of India, and their eggs are highly esteemed as food in Burma. See Lizard colour plate.

Monitor. Armoured vessel of slow speed, light draught, and low freeboard, designed to operate in shallow waters. Her sides are heavily "blistered," i.e. have great out-curving bulges upon them for resisting torpedo attack.

Monitors carry only one or two large guns and offer a small target. The first was built by John Ericsson and used in the American Civil War (*v.i.*). By 1914 the British navy possessed few monitors, and during the First Great War they were used off the Belgian coast. In the course of that war they were developed to mount an 18-in. gun.

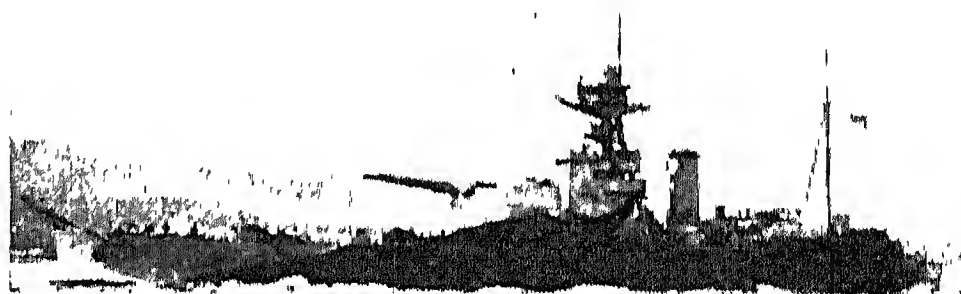
During the Second Great War British monitors were in action off Libya and in the bombardment of the French coast that preceded the Allied invasion of Normandy on June 6, 1944. The Russians used monitors in the defence of Stalingrad and on the Danube.

Monitor, U.S.S. Armoured, raft-like vessel with a revolving turret amidships, designed by John Ericsson for the Federal government of the U.S.A. in 1861. She took part in the first battle between ironclad ships fought in 1862 during the American Civil War. The Confederate ironclad Virginia (formerly the U.S.S. Merrimac) was in 1862 on guard in the James river in the approaches to Richmond, Virginia. On March

8 she destroyed two Federal ships, the Cumberland, which she sank, and the Congress which she burned off Hampton Roads.

On the 9th the Virginia sailed out to attack the Federal flagship Minnesota, which had run aground and was met by the U.S.S. Monitor. An inconclusive battle lasting five hours ensued, at the end of which the Virginia, silenced, broke off action and put in to Norfolk for repairs. The Virginia again closed the James river until, after the fall of Norfolk on May 10, she was burned by the Confederates to prevent her from falling into Federal hands. A picture of Ericsson's Monitor appears in page 3127, in connexion with his biography.

Moniz, ANTONIO CAETANO DE ABREU FREIRE EGAS (1874-1955). Portuguese physiologist and politician. He was born at Avanca and in 1899 qualified in medicine at Columbia University. A year later he entered politics, being elected deputy for Estarreja. A member of the left wing monarchist party, he took part in the abortive revolu-



Monitor. The British monitor, H.M.S. Roberts, completed in October, 1941

tionary movement of 1908, serving a short term of imprisonment for these activities. After being minister at Madrid during the First Great War he was in 1918 appointed foreign minister, and in 1919 attended the peace conference in Paris. Later that year he fought a duel over a political quarrel, and in 1920 retired from political life.

After taking his degree Moniz spent his time in post-graduate study at Bordeaux and Paris, and in 1911 was appointed in a newly created chair of neurology at Lisbon University, a post he held until 1945. During 1927-37 he devised and perfected cerebral angiography, a radiological method of studying the blood vessels of the brain; and he was the first man to perform, on Nov. 12, 1935, the operation of pre-frontal leucotomy (*see under* Brain). For his work on the brain he shared with W. R. Hess the 1949 Nobel prize for medicine and physiology, thus becoming the first Portuguese to win this honour. He died in Lisbon Dec. 13, 1955.

Robert Clive, with 200 English troops and 300 sepoy, took possession of the fort of Arcot, just outside the city, which the defenders had abandoned on his approach. His object was to draw off the French from Trichinopoly, where they were closely besieging an English garrison, and he succeeded in doing this.

Clive entered the fort on Aug. 31, 1751, strengthened the dilapidated defences, gathered provisions, and sallied forth against the enemy. On Sept. 23 the French, with a large body of Indians, took up their quarters in the city, and laid siege to the fort. Clive had only 80 Europeans and 150 sepoy fit for duty, but, although the besiegers numbered some 10,000 and the walls surrounding the mile-circumference of the fort were ruinous, he kept the enemy out.

The final attack was made on Nov. 14, when elephants with iron plates on their foreheads were sent against the gates, but even this failed before the courage of Clive and his men, and the seven-weeks' siege was lifted.

The siege of Arcot established British prestige in S. India, where the French, previously regarded as the dominant military power, never regained their influence.

Arctic, THE. The North Polar, or Arctic, regions, usually considered as the areas poleward of the northern limit of tree growth, comprising an ice-covered tract of ocean completely girded by continental land. The Arctic ocean, area about 5,400,000 sq. m., covers a relatively small north polar basin, with a probable maximum depth of 2,950 fathoms, lying eccentric to the Pole with its greatest extent towards eastern Siberia and Alaska, surrounded by a wide continental shelf of less

than 100 fathoms on which lie many islands and groups of islands. The pack ice of the Arctic ocean is kept in continual motion by the waters which are always flowing toward the main outlet between Siberia and Greenland. Some of it remains in the polar basin, but it has been estimated that 26 billion cubic yards of sea ice are annually drifted to lower latitudes on the waters of the Arctic (see also Arctic Ocean).

The land areas of the Arctic almost enclose the ocean; treeless, they reach latitudes as low as 60° N. or as high as 71° N. and include north Greenland, Spitsbergen, and other islands of the Arctic ocean, the Canadian Arctic Archipelago, Alaska, and the coastal regions of Siberia and Europe as far west as the White Sea.

The distinctive feature of the Arctic is its periods of light and darkness. At the North Pole the sun is out of sight entirely for approximately 6 months while for an equal period it is constantly above the horizon; on the Arctic Circle the sun does not set at the summer solstice or rise at the winter solstice, giving 2 or 3 weeks of almost continuous day and continuous night at those times.

During the period of extended daylight the sun is never very high in the heavens and has little power; on the other hand, except

at times of heavy cloudiness, the darkness of the Arctic night does not approach the utter blackness of temperate or tropical midnight. Winters are bitterly cold and the ground, deeply frozen, thaws only to a depth of a few inches in the short cool summer. Precipitation is meagre—over large parts it is less than 10 ins.; it usually falls as snow. Fogs are of frequent occurrence.



The Arctic. Chukchi woman of Wrangel Island, in the N.E. of Asiatic Russia

The tundra vegetation is typically a dreary stretch of lichen and coarse grass, with dwarf willows, birches, and alders in sheltered hollows. Occasional sun-warmed southern slopes carry flowers, e.g. campion, rock rose, monkshood, thrift, forget-me-not. Except the ice-caps, no Arctic land is devoid of fauna. The numerous animals include the musk-ox, the caribou (reindeer), white Arctic hare, lemming, ermine, and Arctic wolf. The white

polar bear or ice bear is the most characteristic of all Arctic animals. Though an air breather, it is really a sea mammal and is seldom found far from sea-ice. Seals and walrus are other sea mammals. Cod, halibut, capela, and sea birds abound; land birds are rare.

Many peoples touch the Arctic regions towards the northern limits of their expansion, e.g. the Lapps and Samoyeds (or Nentsy) in Europe, the Ostyaks (or Khanty) of the Yenisei, the Tungus (or Evenky), Koryaks (or Nymylany), Yukaghir, and particularly the Chukchi in Asia. The Eskimo (or Innuits) are the only people whose habitat is very nearly confined to the Arctic regions. All these peoples are fishers and hunters and lead a nomadic existence.

Frostbite and snow-blindness are maladies directly attributable to the climate; otherwise the Arctic regions are healthy. Scurvy was once a scourge owing to lack of fresh-food vitamins.

In 1954 the first regular trans-Arctic air service was opened by a Scandinavian airline; the route, from Los Angeles to Copenhagen, lay via Winnipeg and Blue West 8 (on the W. coast of Greenland). The same line intended in 1956 to begin a service from Scandinavia directly over the North Pole via Fairbanks, Alaska, to Tokyo.

Arctic Circle. Parallel of latitude 23½° from the North Pole, i.e. in lat. 66½° N. Since the earth's equatorial plane remains invariably inclined at 23½° to the orbital plane, this north polar cap is presented wholly to the sun in midsummer and turned wholly away in midwinter.



The Arctic. Samoyed fisherman making a net. Branches of the Samoyed people are to be found in all parts of Arctic Siberia

ARCTIC EXPLORATION AND DISCOVERY

Admiral Lord Mountevans, K.C.B., D.S.O.

This narrative describes the various expeditions that have gone out to discover the North Pole and to lands around it. See further the articles on those lands and those on the several explorers, Amundsen, Franklin, Nansen, Peary, and others

The exploration of the North Polar region has been actuated by two motives, the need for new trade routes or new trade commodities and a spirit of geographical inquiry which drove men towards the Pole itself. These two motives have been frequently combined, but, in general, the early explorations resulted from a trading search for either a N.W. or a N.E. passage to China, and the later journeys were scientific in aim. The early desire to achieve a voyage to the Far East by the Arctic Ocean awoke during the period of the great discoveries, and was akin to the spirit which prompted Columbus, Vasco da Gama, and Magellan; the later scientific expeditions aimed at investigating the magnetic, climatic, and oceanographic conditions which prevail in the frozen North.

Story of the North-West Passage

John Cabot began the search for a N.W. passage to the Indies in 1497; he discovered Newfoundland and in 1498 his son Sebastian reached 67° 30' N. Corte-Real, Verrazzano, and Gomez, in the period 1500-24, followed the Cabots, but did little more than inaugurate the lucrative Newfoundland fisheries. Frobisher in 1576 discovered the straits now named Frobisher and Hudson. John Davis made three voyages, achieved a farthest north at 72° 41' N., and explored long stretches of the coasts of Greenland and Labrador. Sanderson's Hope on the map indicates the headland which was his turning-point, and the name was abbreviated from the full title: "Sanderson His Hope of a North West Passage to India." Henry Hudson explored the east side of Hudson Bay and was left to his fate by mutineers after a winter in the ice of James Bay, 1610-11. Baffin attained on July 5, 1616, the lat. 77° 45' N., which was a record in that area for 236 years; he discovered Baffin Bay, Ellesmere Island, and Prudhoe Land. John Ross confirmed Baffin's discoveries in 1818 and penetrated Lancaster Sound for 50 miles. Parry in 1819 traversed Lancaster Sound and reached 114° W in 1820 among the Parry Islands, after spending the winter on Melville Island, and by so doing earned a reward of £5,000 offered by the British Government to the explorer who first went westward beyond 110° W. Other

explorers penetrated among the islands north of Canada, and in 1831 James Clark Ross located the North Magnetic Pole in Boothia Peninsula in 70° 5' N. and 96° 44' W. In 1845 Sir John Franklin with the ships *Erebus* and *Terror*, which had just returned from the Antarctic, led a well-equipped and very promising attempt to sail west from Lancaster Sound; he was last seen near the opening of Lancaster Sound. His failure to return as planned in 1847 stimulated both official and private persons to make vigorous efforts for his relief or to solve the problem of his disappearance.

The search for Franklin marks an epoch in the story of the N.W. Passage, but during the three centuries and a half between 1497 and 1848 other Arctic journeys had been made, most of which had some effect in producing the great outburst of activity in the years which followed 1848. James Cook in 1778 had sailed along the Asiatic and American shores east and west of Bering Strait, in an area where Russians had previously made explorations; in 1816 Kotzebue and in 1826 Beechey reached Kotzebue Sound. The fur trade, inaugurated in 1670 by the establishment of the Hudson Bay Company, led to overland journeys all aimed at discovering the North-West Passage. The mouth of the Coppermine was reached in 1771 by Hearne; and Mackenzie reached the mouth of the river which bears his name in 1789. In 1820 Sir John Franklin made great journeys by sledge and canoe in this region and discovered Point Turnagain; Back reached the Great Fish river in 1833; Dease and Simpson made further journeys in 1838-9; and Rae in 1845-7 completed the exploration of the Hudson Bay region.

Discovery of Franklin Relics

All these travellers had made the N. of Canada sufficiently familiar for land journeys in search of Franklin to be undertaken with some hope of success. Rae in 1848-54 traversed large areas and obtained from the Eskimos Franklin relics and an account of the death of 40 white men. Anderson in 1855, Hall in 1860-2, Schwatza and Gilder in 1878-9, continued Rae's work.

Search was also made by sea in Lancaster Sound, Hudson Bay, and Bering Strait; on one such voyage

McClintock in the *Fox* was beset by the ice in Melville Bay and drifted about 1,200 m. before he was free. From a voyage 1857-59 he brought back a written memorandum on the fate of Franklin: he had died in June, 1847, and the ships had been deserted in the following April after being fast in the ice for eighteen months. Meanwhile McClure in the *Investigator* in 1850-3 reached Banks Island, which had been discovered by Parry, and demonstrated that there was a continuous N.W. passage by sea north of Canada; Collinson in the *Enterprise* during the same period made a similar voyage and obtained Franklin relics.

The cumulative result of all the discoveries showed that most of the members of the Franklin expedition had perished in an attempt to reach safety by a land journey for which they were ill-equipped, and demonstrated that Franklin had penetrated sufficiently far west to reach water navigable to the Pacific. The N.W. passage had been discovered, but it was not until Roald Amundsen navigated the *Gjøa* from sea to sea in 1903-5 that a ship made the complete voyage.

Trading Voyages to the Yenisei

The first efforts to make the N.E. passage led to Novaya Zemlya. Willoughby and Chancellor in 1553, Burrough in 1556, Pet and Jackman in 1580 led the way for Barents, who made important discoveries in 1594-6. The Muscovy Company and the Amsterdam merchants profited by these discoveries to open up trade with Russia. Russian fur hunters gradually pushed their way along the coasts, the most notable being Deschnef, who sailed through Bering Strait to Kamchatka in 1648. Details of the coast were more fully explored during the period 1733-42 by the Russians Muravieff, Pronchistshef, Laptief, etc. Nordenskiöld, after gaining experience in many expeditions during the years 1858-72, proceeded in 1875 to the Yenisei and returned overland, and repeated the journey in 1876; since then many trading voyages to the Yenisei have been successfully accomplished. In 1878 Nordenskiöld took the *Vega* within 120 m. of Bering Strait in one season, wintered off the coast at 123° E., and completed the voyage to the Pacific in 1879.

Whalers went to Spitsbergen, where it became a custom to pass the winter in time to be ready for work in the early spring. Pelham in 1630 was the first to do this. Henry Hudson had explored parts of the island in 1607; Nordenskiöld, Leigh Smith, and many

others continued the explorations. The records "farthest north" attained in this area were Barents, 1594, 77° 20', near Novaya Zemlya; Hudson, 1607, 80° 23'. Whalers had habitually fished the waters of Davis Strait and the ocean E. of Greenland for nearly 250 years; the most notable of these was Scoresby, who followed much of the coast of East Greenland, and reached, in 1806, 81° 30' N., which was a record for this part of the Arctic.

The British Nares Expedition

The 19th century saw many attempts to reach the Pole, which were chiefly made from the Spitsbergen area on the east and by Smith Sound north of Baffin Bay on the west. Parry sailed in the Hecla in 1827 and reached 82° 45' N., north of Spitsbergen, on a sledge journey which kept him 61 days away from the ship. Kane left New York in 1853 in the Advance with the intention of using Eskimo help in a journey to explore N.W. Greenland; he spent two winters in the Arctic, passed through Kane Basin into Kennedy Channel, and reached 80° 10' N., a record for that region. Hayes in the United States followed up these voyages and added to men's knowledge of Ellesmere Land. In 1871 the Polaris in the Hall expedition had the good luck to sail through Kane Basin, Kennedy Channel, Hall Basin, and Robeson Channel into the Polar Sea and to achieve the record for a ship of 82° 11' N. This success led to the British Nares expedition of 1875; with great difficulty the ships were taken through the unfavourable ice conditions and the Discovery wintered in Discovery Harbour and the Alert wintered at Floeberg Beach, 82° 24' N., and established a new record; sledge journeys were undertaken and Aldrich beat Parry's furthest by attaining 82° 48' N., and A. H. Markham the next year reached 83° 20' N.; coast lands were explored and valuable observations made concerning geology, natural history, meteorology, and tidal conditions. The sledge journeys were carried out under very great hardships.

Meanwhile Swedish expeditions had been at work north of Spitsbergen; von Otter took the Sofia to 81° 42' N. in 1868, and Nordenskiöld tried to reach the Pole by reindeer sledging in 1872. In this year Weyprecht and Payer started on an Austrian expedition with the Tegetthof, discovered Franz Josef Land, and reached in 1874 Cape Fligely, 81° 51' N., the nearest known land to the Pole;

Leigh Smith in the Eira explored much of this archipelago in 1880-1. In 1894 Alfred Harmsworth patriotically sent Jackson in the Windward to explore this area thoroughly; he returned in 1897.

From 1770 to 1820 Russians had explored the islands north of Siberia, and Wrangel's companion Aujou reached 76° 36' N. in 1823 and failed to discover the large area of land which was believed to exist in that region. This belief was held until 1881, when De Long's ship, the Jeannette, made a great drift across the Arctic Ocean from north of Wrangel Island to N.W. of De Long Islands.

Scientific work in the Arctic received a great impetus by the establishment in 1881-3 of the international circumpolar stations set out below:

Lat. N.	Long.	Country	Leader
81° 44'	64° 45' W.	U.S.A.	Greely
78° 28'	16° E.	Sweden	Ekholm
73° 23'	124° E.	Russia	Jurgens
72° 23'	52° 44' E.	Russia	Andejeff
71° 16'	158° 40' W.	U.S.A.	Ray
71° 0'	64° E.	Denmark	Hovgaard
70° 0'	8° 28' E.	Austria-Hungary	Wohlgemuth
69° 56'	23° E.	Norway	Steen
67° 24'	26° 36' E.	Finland	Lemstrom
66° 36'	67° 19' W.	Germany	Giese
64° 11'	51° 40' W.	Denmark	Paulsen
62° 39'	115° 44' W.	Britain and Canada	Dawson

The importance of the scheme lay in the attempt to make throughout a whole year systematic and simultaneous observations by trained scientists at as many spots as possible on the edge of the unknown Polar Sea.

Nansen's Famous Voyage

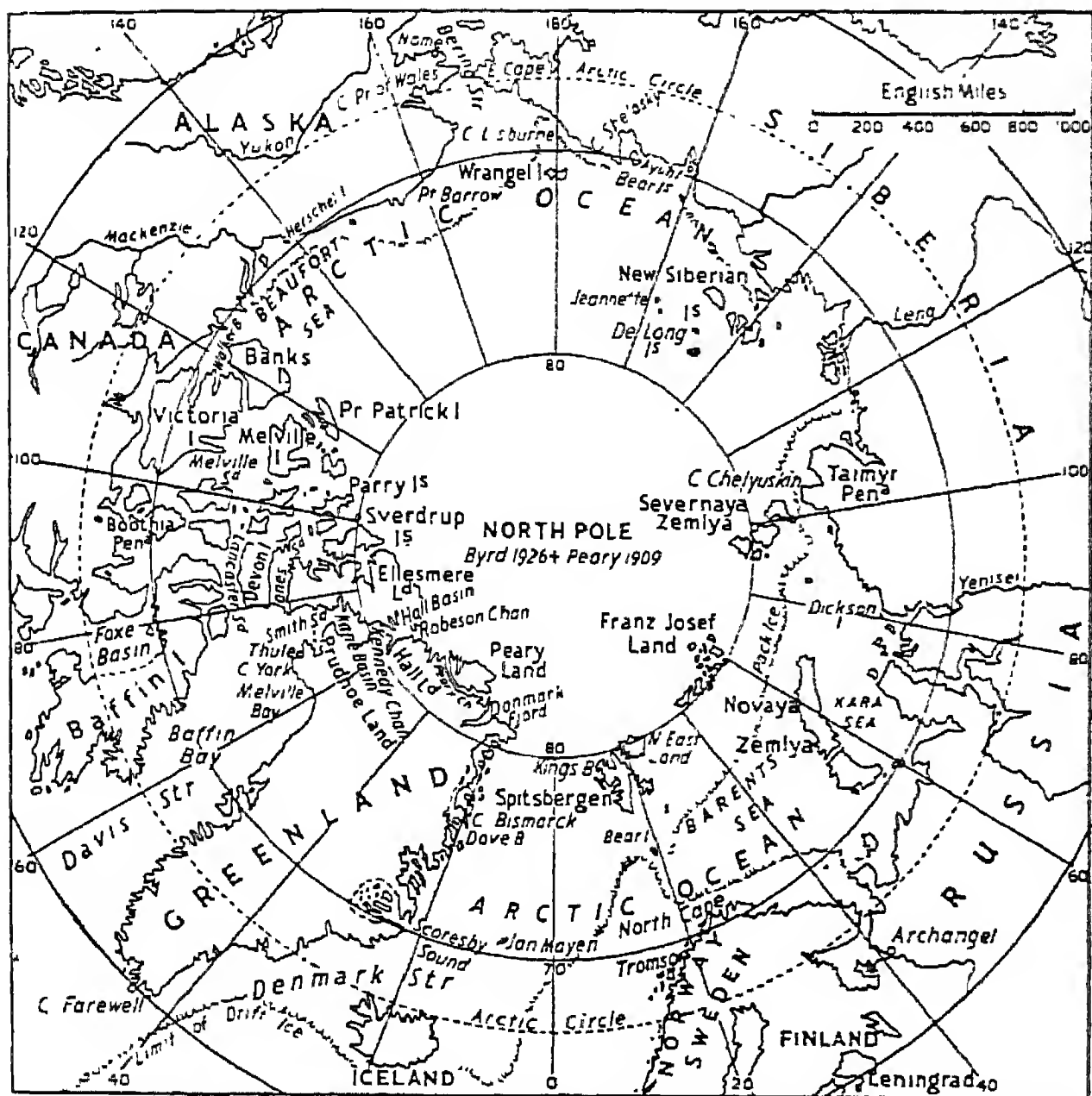
The most notable of these expeditions was that of Greely. Lockwood, his second in command, explored the Greenland coast and discovered Lockwood Island in 83° 24' N., and set up a new record for nearest the Pole; and both Lockwood and Greely made land journeys and explored some 6,000 sq. m. of newly discovered land.

In 1893-6 Nansen, who had previously, in 1888, accomplished the first crossing of the Greenland ice-cap from E. to W., made one of the most famous of polar voyages. He had a specially constructed ship, the Fram, and set out deliberately to have his ship beset by the ice in order to drift over the Arctic Ocean in the fashion of the Jeannette and, if luck favoured him, to float over the Pole. Frozen in about 79° N., the Fram drifted with the ice. Nansen and Johansen attempted a dash for the Pole over

the ice; they reached 86° 14' N. and were picked up in 1896 by Jackson in Franz Josef Land. The Fram, under Sverdrup, drifted on, gained 85° 57' N., rounded the N.E. of Spitsbergen, and safely reached Norway. In 1899 Sverdrup took the Fram west of Greenland and explored Jones Sound. In the same year the duke of the Abruzzi's expedition sailed for Franz Josef Land, and Cagni reached 86° 34' N. by sledge in 1901. In 1897 a most risky attempt to gain the Pole by balloon was made by Andrée from Spitsbergen; no trace of this abortive attempt, beyond three message buoys dropped on the first day of the journey, was found until 1930 when the remains of Andrée and his two fellow aeronauts were discovered at White Island near Franz Josef Land.

Robert E. Peary was the most persistent of the Arctic explorers. He commenced operations in 1886 by a journey on the Greenland ice-cap; in 1891-2 and 1893-6 he made journeys across N. Greenland; in 1898-1902 he explored Ellesmere Land, rounded the N. end of Greenland, reached 84° 17' N. These land journeys familiarised him with the Eskimos and ice conditions. He wintered his ship, the Roosevelt, in the Arctic Ocean in 1905, and gained 87° 6' N. He acquired valuable experience of the ice on the open ocean and established a record by bringing the Roosevelt safely home. In 1908 he took the Roosevelt to the earlier winter quarters, organized a thorough series of relay expeditions, gained the Pole on April 6, 1909, and found no land in sight and a deep sea below the ice-crust.

While Peary had been making his repeated attacks on the N. Pole, the Mylius-Erichsen expedition, greatest of all Danish Arctic ventures, explored Melville Bay and wintered at Cape York. Leaving Copenhagen in the sealer Denmark in June, 1906, with a strong scientific staff, Mylius-



Arctic Exploration. Map of the north polar regions, showing their relation to adjacent continents. The arctic circle is marked by a dotted line

Erichsen led an inspired company to explore and observe a great part of unknown Greenland. Using over 100 sledge dogs, this expedition gave to the world a great store of scientific and geographical knowledge, but it suffered the loss of its leader and two companions through relying on the erroneous map of earlier explorers. Mylius-Erichsen was, through shortage of food, compelled to part company from his supporting sledge-party under Lieut. J. P. Koch, and sailed away, never to be seen again.

Koch's complete sledge journey was one of the finest ever made in the Arctic—1,400 m. in 88 days, 570 m. over undiscovered country. To the Mylius-Erichsen expedition we owe the credit of discovering and charting all the land beyond Bourbon Is., 130 m. N. of Cape Bismarck. The scientific results of this journey were of great value and interest, chief of which was completing the main outline of Greenland, and proving finally that it was an island. Many fossils were found amongst the collections made. On this expedition nearly 200 sledge and boat journeys were made.

Capt. Mikklesen, who in 1908 conducted a search for the relics of the dead explorers, brought home records that disproved the existence of the Peary Channel.

To Mikklesen, and his companion Iversen, may be attributed one of the most Homeric of Arctic journeys—600 m. with insufficient food, with first the leader suffering badly from scurvy, and then his companion falling a victim to the disease. Mikklesen and Iversen were alone for twenty-eight months out of the three years spent by their expedition in Greenland; their story was a most remarkable tale of heroism and sacrifice. Mikklesen made the first crossing of the inland ice-cap between Dove Bay and Danmark Fjord.

Exploration of Greenland

Greenland's glacial plateau has received great attention in recent years. Nansen's crossing of S. Greenland in 1888 and Peary's in the N. in 1892 were followed by more difficult and hazardous crossings by Rasmussen, 1912. The Swiss scientist, De Quervain, 1912, Koch, 1913, Rasmussen, 1916, Hoygaard, Rymill, and Scott, with various companions; all helped to prove that inland meteorological and magnetic stations at high altitudes could if necessary be established and maintained throughout the year in the Arctic, just as Antarctic explorers had proved this possibility in the cruel, white South. This Greenland plateau is a million sq. m. in area, or about five times the size of France, and as

high as 9,000 ft. A journey from N. to S. is about the same distance as from Copenhagen to the Sahara.

Russia has sent many expeditions into the Arctic-Siberian sector. Capt. Vilkitsky, with ice-breakers, attempting the N.E. passage, found islands in the new Siberian group, and in 1913 discovered extensive land, which he named Severnaya Zemlya or Northland, running in a S.E. to N.W. direction up to the 80° parallel and beyond. Vilkitsky was second to Nordenskjöld in making the N.E. passage from W. to E., but first to make it from E. to W.

Roald Amundsen, first to reach the S. Pole, resumed his Arctic explorations in the summer of 1918, when, sailing from Tromsø in his specially constructed ship *Maud*, and taking the N.E. passage as the shortest route from Norway, he passed Cape Chelyuskin and fixed its position on Sept. 9 as the most N. point of Asia, in 77° 44' N., 104° 17' E. The *Maud* wintered in the lee of two small islands, the only shelter available. Amundsen was nearly killed by a bear, and nearly suffocated by a stove later on. His heart was affected, and his lacerated arm troubled him until he obtained surgical aid three years later. The *Maud* broke free on Sept. 12, 1919, when two of her crew left to bring letters and news to Norway, a hazardous business in which they both perished. She made poor progress eastward in 1919, and after passing S. of the new Siberian Islands was forced to winter a second time at Ayun Island near Cape Shelasky. In Aug., 1920, she reached Nome in Alaska; four other men returned home, leaving Amundsen with only three companions to work the ship when he sailed for his projected drift across the Polar sea. All went well until the propeller broke near East Cape, when Amundsen was compelled to winter a third time at Cape Serolekamen. In the spring of 1921, five natives helped to sail the *Maud* to Seattle. Amundsen then turned to flying.

In June, 1922, however, he sailed in the *Maud* from Seattle, with provisions for seven years; but with unfavourable ice conditions at the beginning of the voyage, he handed over command of his expedition to Capt. Wisting, who conducted the Polar Drift. The *Maud* spent next winter in heavy pack, drifting steadily towards N.W., and reaching 74° N. and 170° E. by March 10. In June lat. 75° 30' was reached, and for another two months her track

nearly coincided with that of the *Jeannette* in 1879-80. After passing another winter S. of De Long Islands, she received in Feb., 1924, a message to abandon the voyage. Unfortunately the ship was again caught in the ice near the Bear Islands, and did not end her long voyage until Aug. 22, 1925. Sverdrup, who accompanied this expedition, contributed largely to the scientific results. Wisting failed to take advantage of the drift existing from N. of Bering Strait to the N.W. across the Arctic Basin.

In 1932 the Russian explorer Schmidt became the fourth man to make the N.E. passage—in the ice-breaker *Sibiriakow*—in the record time of nine weeks. From 1936 onwards, following Schmidt's further exploration in the ice-breaker *Chelyushkin*, new Russian commercial routes, internal and external, were opened up.

That modern Viking Amundsen, in May, 1925, made a flight to lat. $87^{\circ} 43' N.$ With Riiser-Larsen as pilot, he flew with two Dornier flying boats from W. Spitsbergen. Lincoln Ellsworth joined him on May 23, after Amundsen had been compelled to come down in an open water lead since half his fuel had been expended. It was a hazardous business for lightly constructed seaplanes to descend among the ice floes, and one machine was wrecked. The two crews, six men in all, lived in the cabin of the undamaged machine until June 15, when, abandoning everything but the barest necessities, they returned. Amundsen reached the N. Cape, and his party was rescued thence by a Norwegian cutter.

Polar Flights

On May 9, 1926, the U.S. explorer Byrd took off from King's Bay, Spitsbergen, flew to the Pole, encircled it, and returned to his base—all in 15 hours. Two days later Amundsen set out in the airship *Norge*, piloted by the Italian Nobile; they crossed the Pole, and landed in Alaska May 14.

Polar flights now became almost fashionable. Nobile, promoted general, took the dirigible airship *Italia* to the N. Pole in 1928, but she was wrecked over the pack ice. Six of her crew were killed, and Nobile himself injured. The valiant Amundsen, who took part in the search, lost his life when his Dornier came down in the sea.

Exploration by air having revolutionised Polar travelling, the names of some of the greatest Arctic explorers, like Rasmussen and Stefansson, are apt to fade

into the background of public memory, but to Rasmussen must be attributed the founding of the most northerly settlement in the world. It is on North Star Bay, in the N.W. part of Greenland, lat. $77^{\circ} N.$ Rasmussen named it Thule. In his extensive sledge trips he found undulations similar to those on the Antarctic plateau, and used both igloos and tents in travelling with his dog teams, who for five or six days on end could average nearly 50 m. a day.

Students' Expeditions

The British did nothing in the Arctic for many years. Then in 1921 George Binney and young men from Oxford and Cambridge inaugurated a new school of British explorers, splendid types like Gino Watkins and Wordie—often classical scholars rather than scientists. They chartered little motor vessels and fearlessly faced the hazards and hardships of the North. Often they took to the air, sometimes they used motor boats, or even kayaks.

Germany has taken a small part in Arctic research. In July, 1930, Wagener established a plateau station, 240 m. E. of Kamarujuk, midway between the E. and W. coasts of Greenland, at a height of 9,700 ft. He lost his life attempting to reach the E. coast, where a station had been set up in Scoresby Sound. The expedition returned to Copenhagen in Nov., 1931.

The Arctic cruise of the German airship *Graf Zeppelin*, commanded by Hugo Eckener, was undertaken at the end of July, 1931, for geographical and scientific purposes. The airship passed over Severnaya Zemlya group of islands and the Taimyr Peninsula, Dickson Island, and near Sverdrup Island, thence along Novaya Zemlya and back to Russia via Archangel. The air view of the Arctic, now for the first time properly photographed, revealed much that was unknown.

In 1928 Sir Hubert Wilkins, who served his Arctic apprenticeship with Stefansson, one of the greatest authorities on the Eskimos, and one of the greatest of Arctic travellers, made his famous flight across the Arctic regions from Point Barrow to Spitsbergen.

In May, 1937, a party of scientists led by Schmidt landed 15 m. from the N. Pole and stayed there until the ice floe on which they had camped drifted southwards. They were taken off by an ice-breaker in 1938.

The 80-ton motor patrol vessel of the Royal Canadian Mounted Police, *St. Roach*, completed the

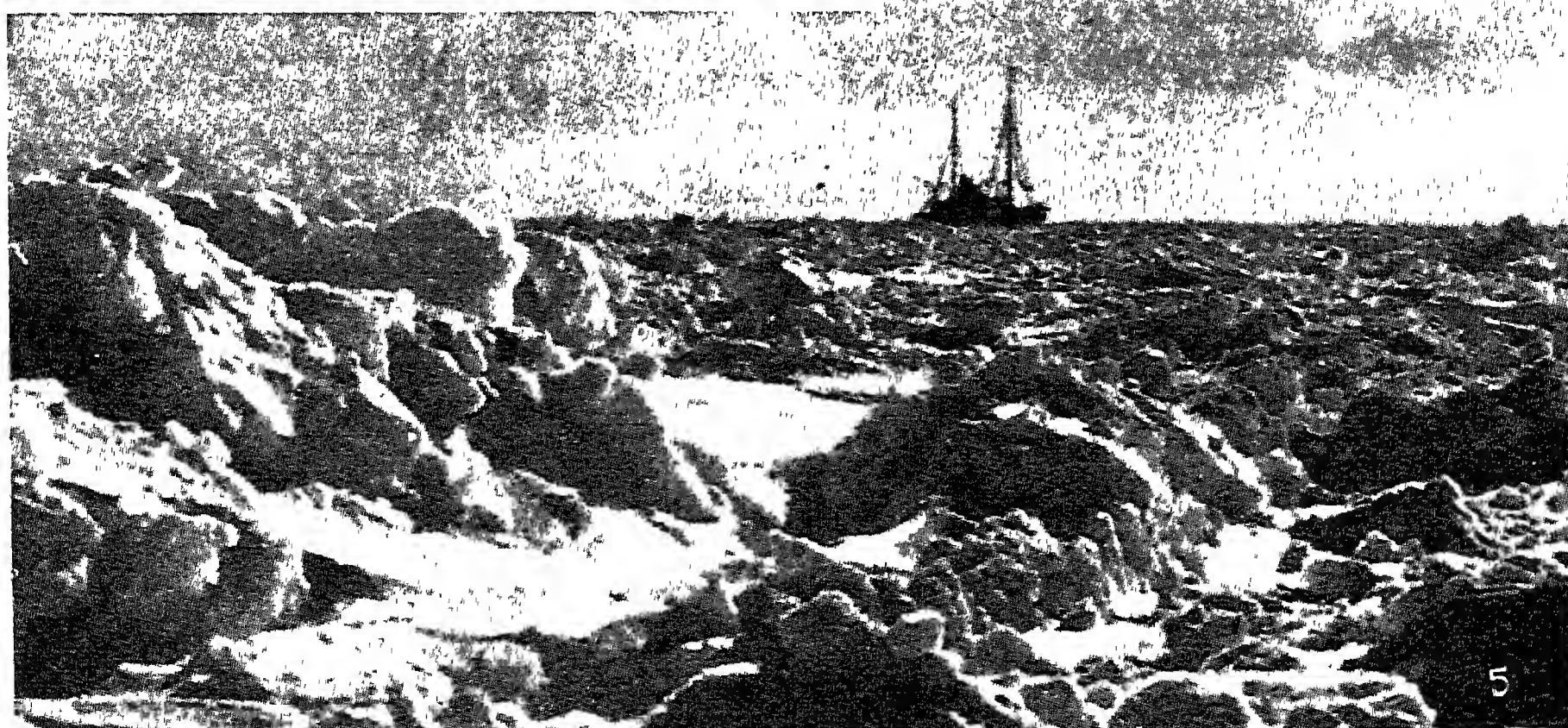
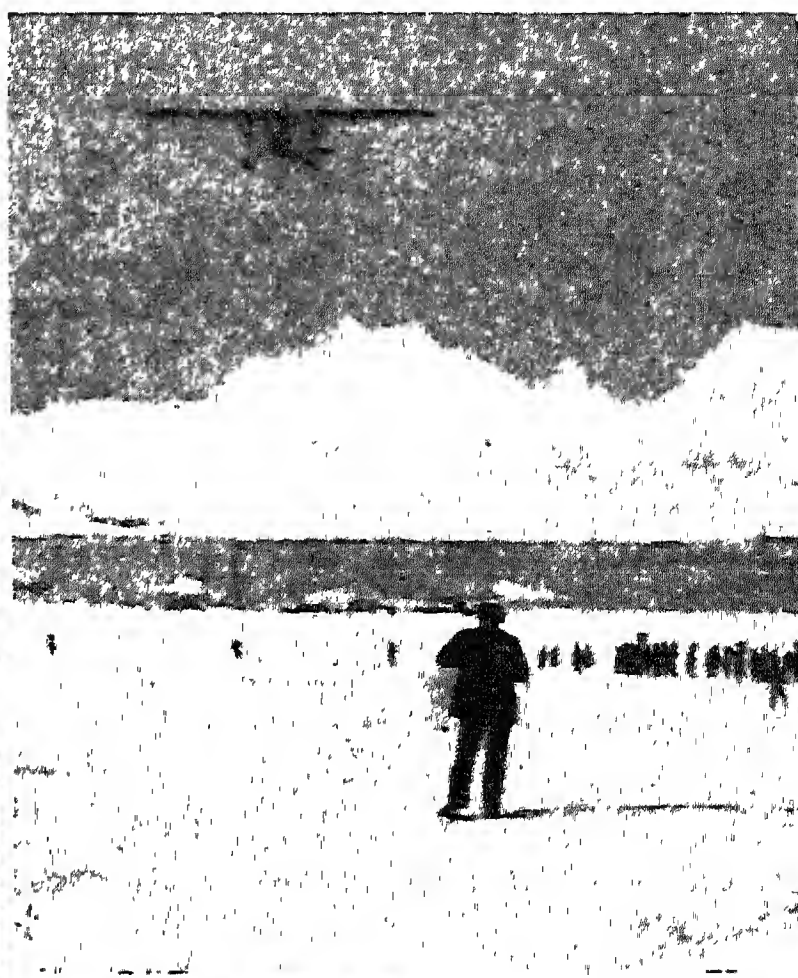
N.W. passage from W. to E. in 1942, under Sgt. H. A. Larsen, a naturalised Canadian born in Norway. The expedition left Vancouver June 21, 1940, and reached Point Barrow on July 22; thence the *St. Roach* voyaged via Herschel Island, Cambridge Bay, and Walker Bay. Wintering at Victoria Island, she voyaged on in July, 1941, and spent a second winter at Pasley Bay. Finally the vessel worked and drifted through the ice and made the Hudson's Bay Company post at Fort Ross, which she left Sept. 2, 1942, to reach Battle Harbour Sept. 22: an epic achievement for such a lightly constructed vessel.

Over the Magnetic Pole

On May 10, 1945, a notable flight in Arctic regions was undertaken by the R.A.F. in a Lancaster aircraft, *Aries*, with the object of flying over the N. and the N. Magnetic Poles. The expedition was captained by Wing-Comdr. McKinley, with Wing-Comdr. McClure, R.C.A.F., as senior observer.

They flew from Reykjavik direct to the N. Pole and back; thence to Goose Bay in Labrador, from which course was laid to the Magnetic Pole, which was located in approximately $76^{\circ} N., 101^{\circ} W.$ Then from Whitehorse, Yukon, a non-stop flight of more than 4,000 m. was made across the N. Magnetic Pole again, and then right across Greenland and the N.E. coast of Iceland. The expedition's aims were to study air crew efficiency and navigational problems peculiar to polar flying; to examine the behaviour of compasses, radar installations, and automatic dead-reckoning gear; to collect meteorological information; and to study topography in the region of the Magnetic Pole. About 2,000 photographs were taken. This was the first time the Magnetic Pole was flown over. Its position was reported to be about 250 m. N.W. of its last presumed position, an observation confirmed in 1946.

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1. Stars and Stripes flying over the North Pole, marking the triumph of Peary, who, in 1909, was the first explorer to reach it. 2. Peary's expedition on the march. 3. Ice floes of the Kara Sea photographed from the Graf Zeppelin in July, 1931. 4. In May, 1926,

Byrd flew over the North Pole, with Floyd Bennett as pilot; here is seen their Fokker monoplane starting from Spitsbergen. 5. Rescue ship Braganza caught in the ice floes during her search for Nobile after his ill-fated flight to the Pole in the dirigible airship Italia in 1928

ARCTIC EXPLORATION: DESOLATE REGIONS WHICH HAVE BEEN CONQUERED BY MAN

Photos 1 and 2, from The North Pole, by R. E. Peary, by permission of Messrs. Hodder & Stoughton

Arctic Ocean. Term applied generally to the waters N. of Europe, Asia, and America. These include the Greenland and Norwegian Seas between Greenland and Norway, the Barents Sea N. of Europe, the White Sea, the Kara Sea between Novaya Zemlya and Yamal Peninsula, and the Beaufort Sea N. of Alaska. It communicates with the Atlantic by Davis Strait, Denmark Strait, and the sea between Iceland and Norway. Its only connexion with the Pacific is by Bering Strait.

It is the best defined and smallest of all the oceans, but, except as regards the Greenland, Barents, and White Seas, is inadequately explored. The polar basin as far as is known has a maximum depth of 2,950 fathoms, which occurs on the Asiatic side of the North Pole; near the pole itself Peary failed to reach bottom with 1,500 fathoms of line. The floor rises steeply to a broad continental shelf with depths of less than 200 fathoms, and often less than 100 fathoms. On this broad shelf lie Spitsbergen, Franz Josef Land, Novaya Zemlya, Severnaya, Zernlia, the New Siberia Islands, Wrangel Island, and the Canadian Arctic Archipelago. The Greenland Sea forms a second deep basin, cut off from the polar basin by a submarine ridge in about lat. 80° N. and from the North Atlantic by the Faroe-Icelandic ridge in about 300 fathoms. Baffin Bay and Davis Strait form a third basin, which is seldom over 300 fathoms in depth and is cut off from the polar basin by ridges within 50 to 100 fathoms below the surface. Bering Strait is about 30 fathoms deep.

The bottom deposits of the Arctic Ocean are mainly of terrigenous origin derived from numerous large rivers, the Pechora in Europe, the Ob, Yenisei, Lena, and Kolyma in Asia, and the Mackenzie in America. The salinity of the surface waters is low. Surface temperature has an annual range of only a few degrees, and is generally about 29° F., except in the eastern part of the Greenland Sea and in the Barents Sea, which are influenced by a branch of the warm North Atlantic drift. These two seas are the only parts of the ocean which are not blocked by ice in winter. About three-quarters of the inner polar basin remains permanently frozen, but navigation is possible in the summer months in the Greenland, Barents, and White Seas, along the N. coasts of Europe, Asia, and

Alaska and in Davis Strait and Baffin Bay. The U.S.S.R. has developed the navigation of the N.E. passage by using ice-breakers, aeroplanes, and radio ice and weather reports. The chief current besides the branch of the North Atlantic drift already mentioned seems to be a general drift across the pole from eastern Asia to Spitsbergen and Greenland. It was this drift that the Fram used in 1893-6, as did the Soviet North Pole expedition of 1937. Circular currents occur in the Greenland Sea. Cold currents pass down the E. and W. coasts of Greenland, carrying ice southwards, which is often a menace on the Atlantic trade routes. There is also a cold current of less importance through Bering Strait to the Pacific. The configuration of the floor of the Arctic Ocean prevents the deeper waters from reaching the Atlantic and Pacific Oceans. Animal life includes bowhead and finner whales, various seals, many kinds of fish, and a rich invertebrate fauna. Diatoms are often abundant enough to colour the surface waters green.

Arcturus OR ALPHA BOÖTIS (Gr. *arktos*, bear; *ouros*, guard). Principal star in the constellation of Boötes, the Herdsman, and third brightest star in the northern sky. It has a very large proper motion, which in the space of 800 years carries it across a space in the sky equal to the apparent diameter of the moon. Yet it has a small parallax, and is therefore very distant, so that its speed of movement has been estimated at 84 m. a second, and its light is about a hundred times that of the sun. It is easily found, apart from its brightness. Starting from the pole star, the last star in the handle of the Plough leads straight to Arcturus.

Arcueil. Town of France, in the department of Seine. It derives its name from Arcus Julianus, a Roman aqueduct. Waterworks in connexion with the supply of Paris were constructed here during 1613-24, and in 1868. In the 16th century Arcueil was a country resort, but the spread of Paris has made it virtually a suburb of that city. Pop. (1954) 18,067.

Arculf (fl. c. 680). Frankish bishop. One of the earliest Christian travellers after the rise of Islam, he visited the Near East about 680, and later told his experiences to Adamnan, abbot of Iona in the Hebrides, from whose account the story was continued by Bede in his Ecclesiastical History.

Ardabil. Town of Persia. It lies near the Caspian Sea and the Russian frontier, 110 m. E. of Tabriz, and at the foot of Mt. Savalan. An ancient city, it was an early capital of the Safavid dynasty, the founder of which, Ismail I (1480-1524), is buried here. His tomb and that of Sheikh Sefiuddin, a 14th-century religious leader, make Ardabil a place of pilgrimage. It is also noted for its hot mineral springs.

The town has an airfield and trades in grain and dried fruit. Pop. (est.) 86,000.



Ardagh. Richly decorated chalice of 8th- or 9th-century Celtic work
Dublin Museum

Ardagh. Village of co. Limerick, Irish Republic, 4 m. N. of Newcastle. A unique silver chalice of Celtic craftsmanship, decorated with gold, enamel, and amber, and inscribed with the names of the Apostles, was discovered here in 1868. It is 7 ins. high, 9½ ins. across, and includes 20½ oz. of silver. It is dated to the 8th or the 9th century.

Ardal OR AARDAL. Town of W. Norway, in Sogn and Fjordane co., at the head of a branch of Sogn fiord. Here a powerful waterfall is harnessed to provide hydro-electricity (800 million kWh p.a.) for the large state-owned aluminium and pig iron works at Øvre Årdal. Pop. (1950) 3,764.

Ardalan OR ARDILAN. Name long borne by the Persian part of Kurdistan. It ceased to be an administrative division in 1938.

Ardashir OR ARTAXERXES. Name of three Persian kings of the Sassanid dynasty (A.D. 226-651). The first, the founder of the dynasty and regenerator of the empire, reigned from 226 to 241. He encouraged his countrymen to revolt against the Arsacidæ (Parthians), to whom Persia was then subject, and by a decisive victory restored his country's independence. During his reign there were conflicts with the Romans under Alexander Severus. Ardashir was a devout Zoroastrian, and the first Persian ruler to assume the title of King of Kings. Ardashir II and Ardashir III reigned from 379 to 383 and from 628 to 630 respectively.

Ardeatine Caves. These caves on the Appian Way near Rome, long used as a dumping place for city refuse, were the scene on March 23, 1944, of a massacre by German troops of 335 Italians in reprisal for the killing by a bomb of 32 German S.S. men in Rome. The victims were indiscriminately picked from the city streets and prisons, marched to the caves, and shot. Mines were exploded and the caves collapsed. Von Mackensen and Mälzer, the two German generals responsible, and Kesselring, the German c.-in- c. who issued the order, were sentenced to death by a British military court in 1946, a sentence commuted to life imprisonment in 1947. Mälzer died in Werl prison March 24, 1952; von Mackensen and Kesselring were released in Oct., 1952. A huge sepulchral stone was erected here in 1949 as a memorial to the victims.

Ardèche. Dept. of S.E. France. Bounded E. by the Rhône, and named after its tributary the Ardèche, the dept. is watered also by the Loire, the Allier, the Ouvèze, and the Chassezac. Its capital is Privas. Ardèche is in the Cévennes region; its wonderful scenery includes the Bois de Païolive, a chaos of huge, tumbled rocks in fantastic groups amidst oaks; and the deep channel of the Ardèche across which stretches the Pont d'Arc, a natural arch.

Ardèche produces cereals, fruit, and good wine; silkworms are reared. Marrons glacés and chestnut jam are specialties. There are paper mills at Annonay; iron ore, diatomite, and graphite are mined. Area 2,144 sq. m. Pop. (1954) 249,077.

Ardee. Town of co. Louth, Irish Republic. On the Dee, 40 m. N.W. of Dublin, it has distilleries, and tanneries, and manufactures baskets. It has a 13th-century castle, now the court house. It received a charter in 1377, suffered much in the Irish and English wars, and was involved in the Sinn Féin rebellion of 1916. Market day, Tues. Pop. (1951) 2,492.

Arden, FOREST OF. A district of Warwickshire, England. To the N. of the Avon, it is well-wooded, and is known as the woodland country, as distinct from the open country S. of the river. The Forest of Arden is the scene of most of *As You Like It*.

Ardennes. A range of hills in France, Belgium, and Luxemburg. It includes remains of a great forest which, extending

probably to the Rhine, is mentioned by Caesar and other early writers; today it is confined to the wooded heights on either side of the Meuse. The Belgian Ardennes, i.e. the woods to the E. and S. of Dinant, were a popular holiday resort. Game and wild animals are plentiful, and include the wild boar. Coal, iron, lead, and other minerals are worked.

Ardennes. A department of France. Bounded by Belgium and the departments of Aisne, Marne, and Meuse, it has an area of 2,027 sq. m. The rivers Aisne and Meuse flow through it, and are joined by the Canal des Ardennes. Mining, especially of slate, and agriculture are the chief industries. Part of the Argonne is herein. Mézières is the capital, other towns being Rocroi, Sedan, Rethel, Charleville. Pop. (1954) 280,940.

Ardennes, FIGHTING IN THE. The Ardennes district figured in two important battles of the Second Great War. The first was the German break-through of May, 1940, opening move in the first battle of France. A German force of about 50 divisions had been marshalled, almost in full view of Allied observers across the frontiers, as French objections had prevented the bombing of enemy formations thus building up. Gen. (later F.-M.) von Rundstedt was in chief command of this large force, which after the break-through was charged with other important operations. Four German armies were included—under Gens. Kluge, Blaskowitz, Witzleben, and Bock. Guderian's two armoured corps were attached to the first two as a spearhead.

After crossing the Meuse and the Albert Canal (May 10–12), German armour and infantry pressed forward through the Ardennes. The region was thought to be impracticable terrain for armoured forces, and was therefore only lightly manned by French and Belgian troops. But by May 13 the enemy had reached the Meuse at a point west of Liège, and from Namur to Sedan German forces were within striking distance of the Meuse bridgeheads. The French 9th army (Gen. Corap) held the sector Namur-Mézières, which was virtually the hinge of the Allied line. Corap's troops were taking up positions when, on May 13, the Germans approached the Meuse. Across half a dozen bridges here, left undemolished by the French, the Germans poured, making a gap 50 m. wide in the Allied line.

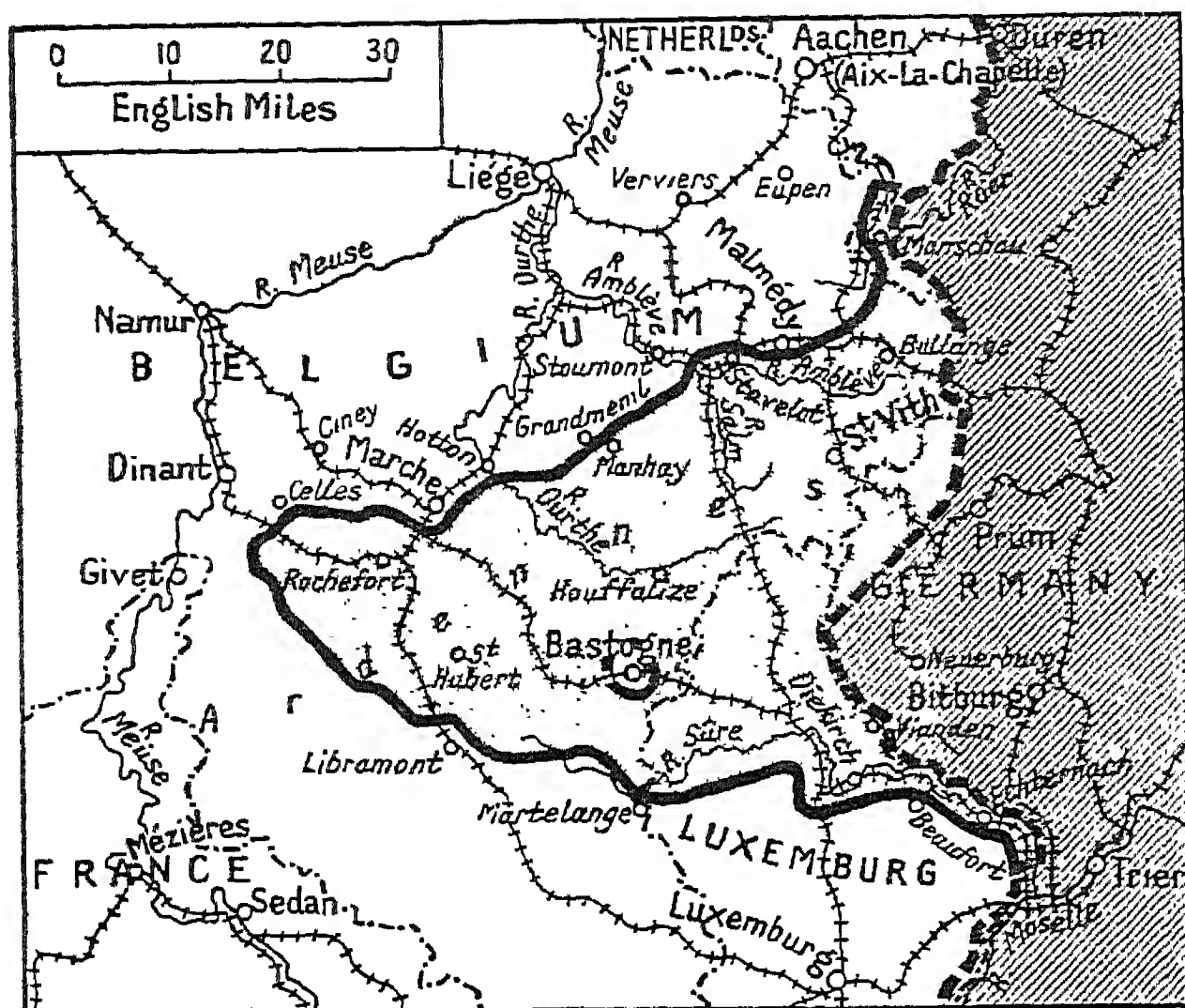
On Corap's right was the French

2nd army, in front of Sedan. Early on May 13 the French here were driven back and their line was breached. Sedan was abandoned. Corap's army fell back in disorder. Its commander was dismissed on May 14. Gen. Giraud, appointed as his successor, was captured by the Germans on May 16 at La Capelle. By now, along the sector between Namur and Sedan, the battle had become open warfare. The German break-through had been complete, and in due course enforced a withdrawal of Allied troops in Belgium, and the defeats ending in the evacuation of Dunkirk (q.v.).

The Ardennes again became the scene of heavy fighting during the last German counter-offensive of the war (see map, p. 588). The region had been liberated by the U.S. 1st army in Sept., 1944. An Allied offensive, with a line-up along the Rhine as its objective, began in Nov. By mid-Dec. the U.S. 9th and 1st armies had advanced beyond Aachen to the left bank of the Roer river; the U.S. 3rd army had reached the Saar. But the line between these sectors was held very lightly. Once again too much reliance had been placed on the undoubted difficulty of the Ardennes country, then in the grip of winter, for on Dec. 16 Rundstedt began an attack from a line Monschau to Echternach. Under cover of fog, which had prevented air reconnaissance, he had assembled the 5th and 6th Panzer armies (ten armoured divs.) and 14 infantry divs., also a Panzer brigade which operated in U.S. equipment and caused confusion and panic in and immediately behind the U.S. front line.

Four U.S. divs. in the Eifel area met the first onslaught, slowing but not stopping it; a fifth held St. Vith for several days. But a breach was made in the Allied line which cut off the 1st and 9th armies from their group h.q. in Luxemburg. Gen. Eisenhower immediately ordered a cessation of attack to N. and S. and concentration of all possible forces in the danger zone, to prevent the Germans from widening the base of their assault. He also placed 1st and 9th armies temporarily under F.-M. Montgomery.

Airborne, armoured, and infantry units were moved up from reserve, the 101st U.S. airborne div. with armoured support being placed at the vital road junction of Bastogne, where it was surrounded by superior German forces on Dec. 21.



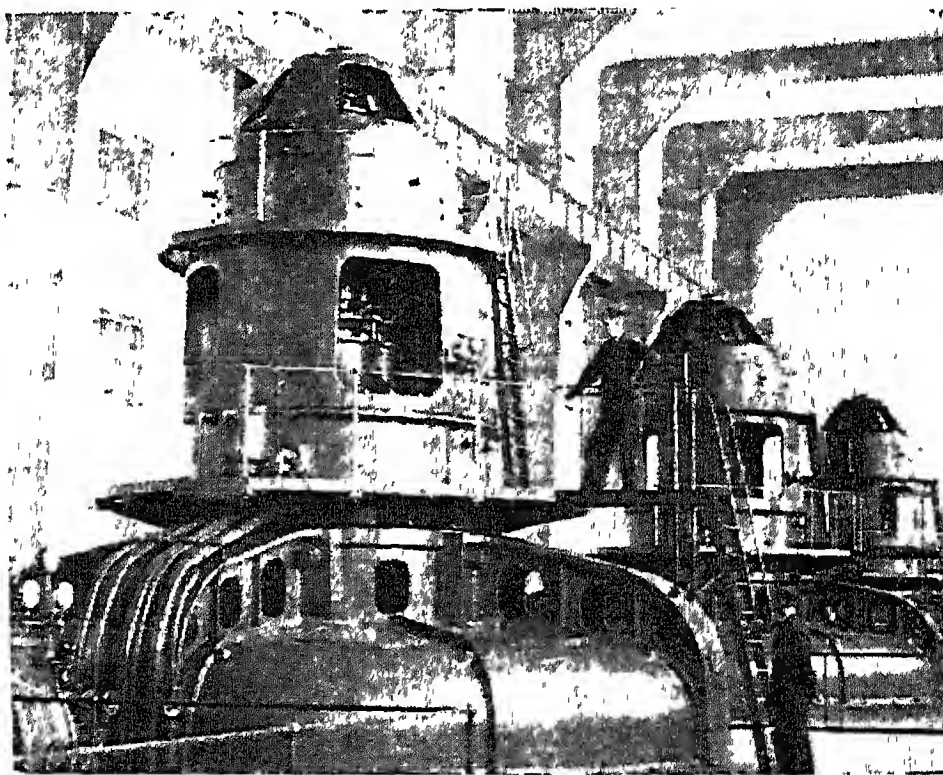
Ardennes. Map of the country affected by the last German counter-offensive, Dec., 1944. The shaded area indicates greatest extent of German penetration

The flanks of the breach at Monschau and Echternach were held, and the salient compressed from N. to S.; but penetration threatening the Meuse developed on a narrowing front, the Germans being aided by continuing fog until on Dec. 22 the weather improved, and Allied air forces began violent attacks on German rear communications. Relief by an armoured division of the 3rd army reached Bastogne on Dec. 26, on which day also the German drive, 45 m. wide at its base, and 60 m. deep, was stopped near Celles, within 4 m. of the river. The initiative then passing to the Allies, the 1st army attacked from the N. towards Houffalize on Jan. 3, 1945, the 3rd army from the S. towards the same place on Jan. 9. By Jan. 10 they were only 10 m. apart, and the Germans were beginning to withdraw from the tip of their salient. On the 16th they met, and on an unbroken front began to press the Germans eastward. By Jan. 31 the Allied line was restored to that of mid-Dec. A memorial to 76,890 Americans killed, wounded, or missing in the Ardennes battle was dedicated at Bastogne, 1950.

Ardglass. Parish and town of co. Down, N. Ireland. Picturesquely situated amid hills at the head of a small bay, 6 m. S.E. of Downpatrick, it is served by a branch rly. line. It was at one time the second commercial town of Ulster, but its trade has greatly declined. Small vessels can enter the harbour, a station for the

herring fishing fleet. Ardglass has ruins of several old castles or forts, said to have been built as stores by an English trading co. in the reign of Henry IV. Pop. (1951) 950.

Ardingly. Village of Sussex.



Ardnacrusa. Section of the huge power house of the Shannon power installation, near Limerick

England, 5 m. N. of Hayward's Heath. Here, dating from 1858, is one of the public schools founded by Canon Woodard. Otherwise the village history is dominated by memories of the Colepeper family, one of whom in 1590 built Wakehurst Place.

Ardlamont Mystery. Shooting fatality at Ardlamont, Argyllshire, Scotland, on Aug. 10, 1893. The victim was a youth named Hamborough, who was reading for the army with Alfred John Monson. Hamborough had recently insured his life for £20,000,

and assigned the policies to Mrs. Monson "for money received." At Monson's trial for murder, at Edinburgh, in Dec., the defence declared that he was aware that the assignment was void in Scots law, as made by a minor; and the verdict was "not proven." A man named Scott, summoned as a witness, was formally outlawed on failure to appear, the ban being later removed. On July 3, 1898, at the Old Bailey, London, Monson was sentenced to 5 years' penal servitude for conspiring to defraud the Norwich Union Life Insurance Society.

Ardlui. Village of Dumbartonshire, Scotland. It stands at the N. end of Loch Lomond, and has a railway station. It is also on the well-known motor road W. of the loch, and is a popular centre for boating, fishing, and mountain climbing, with Ben Vorlich (3,092 ft.) in the vicinity.

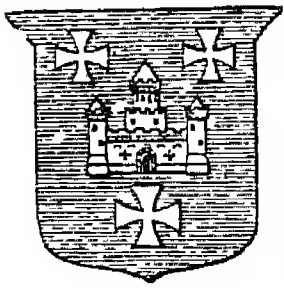
Ardnacrusa. Locality in co. Clare, Irish Republic, 3 m. N. of Limerick. Here is the hydro-electric power-station in the scheme which harnesses the force of the river Shannon. The construction carried out by the firm of Siemens-Schücker, was begun in 1925, and finished towards the end of 1929. Each of the three vertical turbines can develop 38,500 h.p.

Ardnamurchan. Parish of Argyllshire, Scotland. It forms the westernmost portion of the mainland, covers an area of 171 sq. m.; the pop. in 1951 was 948. The estate of Ardnamurchan is noted for its deer forests, beautiful rocky scenery, and salmon fisheries,

and contains the ruins of Mingary Castle, the ancient seat of the MacIans, which was twice taken by James IV and was ravaged by the Macdonalds of Antrim, 1644. Ardnamurchan Point is the westernmost extremity of the mainland of Great Britain.

Ardoch. Parish and village of Perthshire, Scotland. It is 12 m. N.N.E. of Stirling, and has the best-preserved Roman camp in Great Britain. The camp measures 500 ft. long by 430 ft., has huge ramparts and deep ditches, and retains three of its four gates.

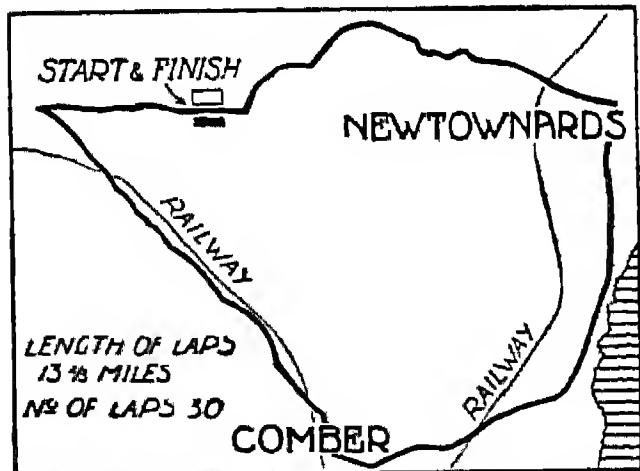
Ardrossan. Police burgh, seaport, and holiday resort of Ayrshire, Scotland. It is 30 m. S.W. of Glasgow by railway, and is a thriving town with a well-sheltered and accessible harbour, and commodious dock accommodation.



Ardrossan arms

Shipbuilding, engineering, oil storage, and fishing are the leading industries, and chemicals and coal the chief exports. The town owes its rise to the harbour. It was begun in 1806 by the 12th earl of Eglinton, and was to have been connected by a canal with Glasgow. The undertaking proved to be too ambitious and costly, and a few years before the death of the earl in 1819 the scheme was temporarily abandoned. The next earl carried on the work, and in 1833 the harbour, a much smaller one than originally planned, was completed, the total outlay having exceeded £200,000. Ardrossan has ruins of the castle of the Montgomeries, captured by Wallace, razed by Cromwell. Pop. (1951) 8,799.

Ards Circuit. A motor-racing course near Belfast, Northern Ireland, used annually from 1928 to 1936 for the Tourist Trophy race organized by the Royal Automobile Club. The course is 13½ m. of ordinary roads specially closed for the occasion. The highest average speed at which the race over 30 laps was won was 78.01 m.p.h., by F. W. Dixon and C. J. P. Dodson, driving a Riley, 1936.



Ards Circuit. Motor-racing course near Belfast. One section borders Strangford Lough (shaded)

The record for one lap is 85.52 m.p.h., by L. Lebeque, driving a Delahaye in the same year.

Ardsley. Former urban district in the W. Riding of Yorkshire, England, part of the county borough of Wakefield. Ardsley is served by railway, has extensive collieries, and manufactures woollens and bricks.

Are (Lat. *area*, piece of level ground). French unit of superficial or land measure. It is a

square whose sides are each 10 metres long, thus containing 100 sq. metres, equal to 119.6 English sq. yards. Ten ares equal one decare, 100 ares one hectare.

Area. Numerical measure of superficial extent. If geometry, as its name implies, originated in the measurement of land, the concept of area was probably the primitive geometrical idea. The unit of area is naturally the square whose side is the unit of length, e.g. the square foot or the square yard. The idea of area is naturally applied in the first instance to a plane surface, but may be extended to curved surfaces, such as the cylinder, cone, and sphere. See Circle; Geometry; Sphere, etc.

Areca. Genus of lofty palms belonging to the family Palmae. Natives of the tropics, they have a crown of long, graceful leaves which are broken up into numerous slender leaflets in two rows. *A. catechu*, of India, produces the well-known betel-nuts and catechu. Areca nut is used as a vermifuge for dogs.

Arecibo. Town of Puerto Rico. It stands on the N. coast, 30 m. by rly. W. of San Juan, and exports coffee and sugar. Its harbour is an open roadstead. Pop. (1950) 28,659.

Arena (Latin, sand). A term specially applied to the sanded circular space reserved for gladiatorial combats in the centre of the ancient Roman amphitheatre. The sand on these arenas was intended to prevent combatants from slipping. The term is also used generally for any space or enclosure in which public contests are held, and figuratively for the scene of action of political or other struggles.

Arenaceous Deposits (Latin *arena*, sand). Sedimentary rocks formed of relatively coarse detrital material. They are so called in contradistinction to argillaceous or clayey deposits, and include conglomerates, grits, sandstones, gravels, and sands.

Arenberg OR AREMBERG. Duchy of the Holy Roman Empire. It lay between Jülich and Cologne, to the west of the river Rhine. As a separate district Arenberg appeared in the 12th century or earlier. One of its lords was made a prince of the empire and another a duke. The Napoleonic cataclysm led to the disappearance of the duchy as a semi-independent state after the congress of Vienna; but the valuable estates remained, and the titles prince and duke of Arenberg were still in use in 1956.

Arenicola (Lat. *arena*, sand; *colere*, to inhabit). Generic name of the lob-worm. Common on all sandy shores, where its castings may be seen at low tide, this worm is used as bait.

Arenig Series. Lowest major subdivision of the Ordovician system of rocks. It is named after Mt. Arenig in N. Wales, where the rocks are well developed. It is



Areca catechu, the Indian palm which produces the betel-nut and catechu

composed mainly of grits and dark shales, which yield a highly characteristic fauna of graptolites and trilobites. Rocks of this age occur in Western Europe, Bohemia, the Eastern U.S.A., Canada, Australia, and New Zealand. In Britain the Arenig was a period of widespread volcanic activity.

Arensburg (Est. Kuressaare). Swedish and more familiar name of a fortified port of Estonia S.S.R. It stands on the S. coast of Oesel, in the Baltic Sea, has a large and deep harbour, and is an important commercial centre. It imports coal and skins, and exports timber. Arensburg became an Estonian town when Oesel was given up by Russia in 1919. By the pact of Sept. 28, 1939, the U.S.S.R. was allowed to establish a military base here. Captured by the Germans in 1941, Arensburg was retaken by the Russians Oct. 7, 1944.

Arensky, ANTON STEPANOVICH (1861-1906). Russian composer. Born at Novgorod, Aug. 11, 1861, he studied with Zikke, and with Rimsky-Korsakov at the St. Petersburg conservatorium. In 1882 he became professor at Moscow conservatorium, and was director of music in the Imperial

Chapel, St. Petersburg, 1894-1901. He died in Finland, Feb. 25, 1906. His works include several operas.

Areois. Secret society formerly widespread in Polynesia. Mentioned by Captain Cook, and investigated by Ellis, this institution, fully developed in Tahiti and the Marquesas, extended to Hawaii and elsewhere. Tahiti had six lodges, adjacent islands six more, each with a grand master and seven or nine degrees, with distinctive tattooing. The initiate began by mastering the songs and dances. Membership was highly prized, and continued after death. Women held a communal position; infanticide, due to economic pressure, was characteristic of the general social custom of the time. The fraternity came in, as a puberty institution, with an immigrant people from the west, who practised sun-worship and were probably the megalithic builders. From a semi-sacred organization it degenerated into a professional dramatic troupe, long hostile to Christian missions, and now extinct. See Secret Societies.

Areopagitica. Prose tract by Milton. Further described as a speech for the liberty of unlicensed printing, it was published Nov. 24, 1644. It is doubtful whether Milton took the title from the oration of Isocrates, so named, or derived it from the Areopagus. It is regarded as one of the finest pieces of English prose ever written. There are good editions of the treatise by James Russell Lowell, 1890, J. W. Hales, 1898, C. E. Vaughan, 1900, and R. C. Jebb, 1918. See Milton, John.

Areopagus (Gr., Hill of Arēs). Hill in Athens, W. of the Acropolis, on which stood a temple to Arēs. It was the meeting-place of the famous council of the Areopagus, an assembly of elders drawn exclusively from the noble classes. Originally the governing body of Athens, its powers were limited by the constitution of Solon, later by that of Cleisthenes, and further reduced by Ephialtes in 462 B.C. Aeschylus, in his treatment of the story of Orestes, makes Orestes, when pursued by the Furies for the murder of his mother, appear before the Areopagus to submit his case to their judgement. It is a disputed point whether S. Paul delivered his speech (Acts 17) before the court itself, which was still in existence, or from the hill. See Athens.

Arequipa. Variant name of a volcanic mt. in the Peruvian Andes, known also as El Misti (*q.v.*).

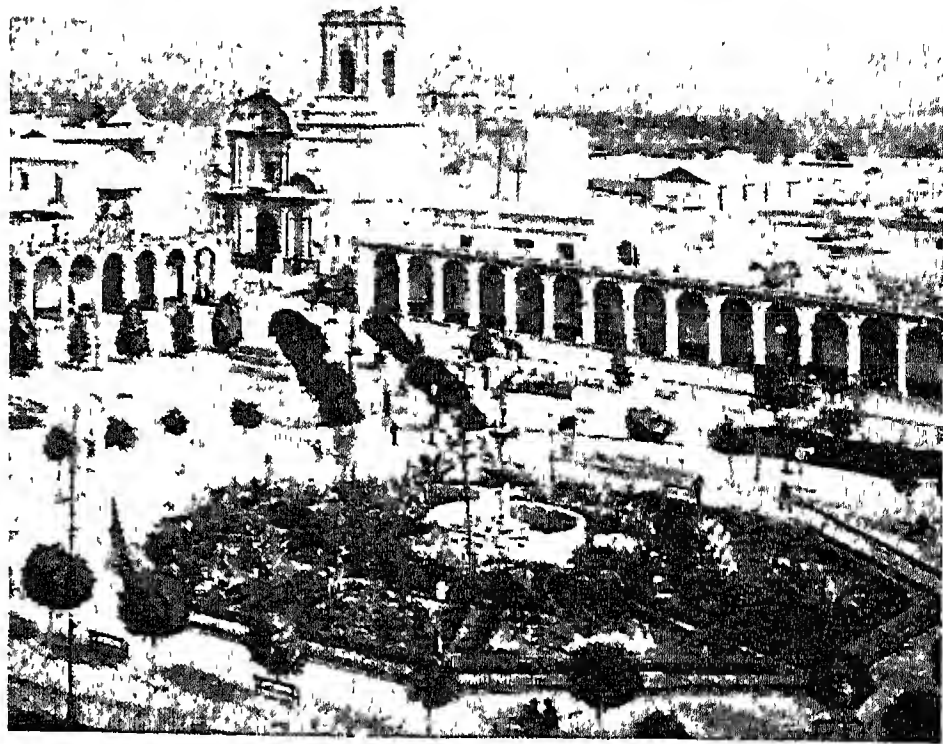
Arequipa. A maritime department of S. Peru. Mountainous, with many fertile valleys, it has an area of 21,947 sq. m., produces cotton, wheat, rice, and sugar, and has valuable gold, silver, and borax deposits. Arequipa is the capital. Pop. (est.) 157,000.

Arequipa. A city of Peru. The capital of Arequipa department, and the third city of Peru, it is 107 m. by rly. N.N.E. of Molendo, its port, and stands on the Rio Chile, 7,750 ft. high, at the foot of El Misti volcano. It is the seat of a bishop, and possesses a handsome cathedral, several large churches, and a university. Its main industries are canning, brewing, and the making of candles, soap, and leather. It exports wool, borax, and gold and silver ores. It was founded in 1540 by Pizarro. It has suffered severely from earthquakes, those in 1600 and 1868 causing great destruction and loss of life. Near are hot mineral springs and an observatory founded by Harvard. Pop. (est.) 90,000.

Arēs. In Greek mythology, the god of war, identified by the Romans with the old Sabine deity Mars. Arēs was the son of Zeus and Hera, and the lover of Aphrodite, with whom he was detected in adultery by her husband Hephaestus (Vulcan). In the struggle between Zeus and the Titans he was kept prisoner in Hades for 15 months by the giants Otus and Ephialtes. During the Trojan War he sometimes took the field on behalf of the Trojans; on one occasion he was driven off, wounded and discomfited, by Athena and the Greek hero Diomedes. He had a temple on the Areopagus, where, according to the legend, he was tried on the charge of putting to death a son of Poseidon, but was acquitted. The original home of his worship is supposed by some to have been Thrace, by others Boeotia. See Mars; Mythology.

Aretaeus. Greek physician and writer on medicine. He probably lived in the 1st century A.D., and was the author of treatises, most of which are extant, on diseases and their remedies.

Arethusa. In Greek mythology, a nymph of Elis. While bathing she was seen and amorously pursued by the river god Alpheus. At her entreaty Artemis changed her into a fountain which disappeared underground, rising again in the island of Ortygia, near Syracuse in Sicily. Alpheus is said to have mingled his stream with that of Arethusa, and it was popu-



Arequipa. The plaza, or great square, of the third city of Peru, founded by Pizarro in 1540.

larly supposed that anything thrown into the river came up again at Ortygia. Shelley tells the story in his poem *Arethusa*.

Arethusa, H.M.S. The first ship of this name was the French *Arethuse*, captured in the English Channel by H.M.S. *Venas* in 1759. The well-known 18th-century song, *The Arethusa*, describes a later action, 1788, of the same ship. The fourth of the name, laid down as a 50-gun frigate and launched in 1849, took part in the Crimea campaign, and was handed over in 1874 to become a training ship. For many years she was moored in the Thames off Greenwich, Kent, where thousands of boys of the Shaftesbury Homes (*q.v.*) received their training. In 1932 she was condemned by the Admiralty as unfit for further service. A four-masted barque, *Peking*, built 1911, was purchased and converted by the Shaftesbury Homes and inaugurated as the *Arethusa* training ship in 1933, with a new berth on the Medway, opposite Chatham Dockyard. During the Second Great War the government took over the ship.

The sixth *Arethusa*, launched 1913, was the first of her type of fast, lightly armoured cruisers, specially designed to operate against hostile destroyers. She was badly damaged in the battle

of Heligoland Bight, Aug. 28, 1914, but played a prominent part in the Dogger Bank battle of Jan. 24, 1915. On Feb. 11, 1916, she struck a mine, while on a North Sea patrol, and became a total wreck.

The seventh *Arethusa* was a cruiser, built Jan., 1933–Feb. 1935, at a cost of £1,251,161. She displaced 5,220 tons, and her armament included six 6-in. and eight 4-in. guns. She took part in the Norwegian campaign in 1940, and was present at the capture of the *Altmark* (*q.v.*). In 1942 she bombarded Rhodes, but was torpedoed at the end of that year. Repaired, she joined in the bombardment of the Normandy coast on June 6, 1944. Earmarked for scrapping, the *Arethusa* was refitted in 1948 as a target ship for R.N. tests of the effects of gamma rays on warships under atomic attack.

Aretinian Syllables. Names for the notes of the musical scale. The six syllables, to which a seventh was added, were first used by Guido d'Arezzo in the 11th century. They were derived from the first syllables of the lines of a hymn to S. John which happened to begin on successive notes of the ascending scale. The six syllables were *Ut, Re, Mi, Fa, Sol, La*, and to these was added *Si* for the seventh note. The complete stanza and notes of the hymn may be seen in Grove's Dictionary of Music and Musicians. See Tonic Sol-Fa.

Aretino, PIETRO (1492–1556). An Italian poet and wit. Born at Arezzo, Tuscany, and patronised by the Medicis, the emperor Charles V, and Francis I of France, he achieved notoriety as the author of 16 exceedingly licentious sonnets (*Sonetti Lussuriosi*). Such fame as remains to him he derives

from his letters, five comedies, and a tragedy, *Orazia*. He spent his last years at Venice.

Arezzo. Province of Tuscany, Italy. Mainly mountainous, it extends across the Apennines, and produces cereals, oil, wine, and mulberries, and manufactures leather, woollens, and hats. Area 1,274 sq. m. Pop. (1951) 325,696. An earthquake on April 26, 1917, caused considerable damage, destroying the village of Monterchi.

Arezzo. Town of Italy. The capital of Arezzo province and an episc. see, it stands near the junction of the rivers Arno and Chiana, 54 m. by rly. S.E. of Florence. The ancient *Arretium*, its walls were built in 1320 and rebuilt 1541–68, and its citadel, constructed in 1502, was demolished by the French in 1800. The Gothic cathedral, begun in 1277, contains many fine sculptures and the tombs of Gregory X and Tarlati di Pietramala, the warlike bishop



Arezzo, Italy. The 11th century church of S. Maria della Pieve

of Arezzo. The chief industries are pottery, and silk and cloth manufactures. One of the twelve Etruscan cities and an important military position, it was allied to Rome in 310 B.C., was sacked and repopled by Sulla, and suffered in the Ghibelline-Guelfic contests.

Occupied by the Germans after the Italian armistice of 1943, the town was subjected to frequent Allied air attacks as a key centre of communications. At the end of June, 1944, British troops of the 8th army approached the town from the S., but Arezzo was defended for three weeks before the Germans withdrew and the Allies entered. Damage was heavy, especially round the rly. station, but churches were relatively undamaged. Paintings and valuable

ceramics were lost when the museum was hit by a bomb. Three famous palaces, the Pretorio, Comunale, and Albergotti, suffered, also an ancient amphitheatre. Pop. (1951) 67,734.

Argaeus, MOUNT (Turk. Arjish Dag). Extinct volcano and the loftiest summit in Asia Minor. It has two craters and is regarded as 12,565 ft. high: one estimate is nearly 2,000 ft. higher. On a spur of the Taurus range, a few miles from Kaiseriye (Caesarea), it has not erupted for many centuries.



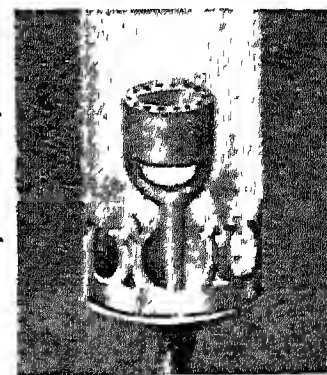
Argali. Wild sheep of the Altai Mountains

Argali. Wild sheep found in the Altai Mts. and on the steppes of Siberia. It is about the size of a small donkey, and has magnificent, closely ribbed horns, which form almost a complete circle. It is pale brown in colour with a white face, and in winter a large ruff of white hair develops round the neck. The argali is found at an altitude of from 3,000 ft. to 4,000 ft., the flocks keeping to the same feeding-ground from year to year. The flesh makes good mutton.

Argall, SIR SAMUEL (c. 1585–1626). An English adventurer. He went to Virginia in 1609, and in 1612 he abducted the Indian princess Pocahontas, and held her a willing prisoner as a means to secure peace with the Indians. He was deputy governor and admiral of Virginia, 1617–19, and served in an expedition against Algiers 1620. He was knighted in 1622, after returning to England.

Argand, ARMÉ (1755–1803). Swiss physician and chemist. In 1784 he invented the Argand lamp,

in which combustion was much improved by the use of a cylindrical wick and the admittance of air to the central tube from below. This doubled the



Argand Burner

area of wick in contact with the air. A glass chimney was added to improve the draught. When William Murdock (*q.r.*) introduced gas lighting, he adopted Argand's principle for the burners.



Pietro Aretino, Italian poet and wit
Titian. Pitti Gallery, Florence

Argao. Town of the Philippine Islands. It stands on the E. coast of Cebu, 36 m. S.S.W. of Cebu town, and was founded in 1608. The locality produces rice and sugar. Pop. 35,400.

Argaum OR **ARGAON.** Town of Madhya Union, India, 31 m. N. of Akola, notable for the battle fought Nov. 28, 1803, between the British under General Wellesley, afterwards the duke of Wellington, and the troops of the Mahratta chieftains. The issue was for some time in doubt, but after fierce fighting the Mahrattas abandoned their guns and fled. The name Argaum means the city of wells.

Argelander, FRIEDRICH WILHELM AUGUST (1799–1875). German astronomer. He was born at Memel, March 22, 1799, studied law in Königsberg, but was induced by Bessel to devote himself to astronomy. In 1820 he became assistant at the Königsberg Observatory, in 1823 director of the observatory at Abo, and in 1828 professor at Helsingfors, to which city the Abo Observatory was transferred. In 1837 he was nominated professor-director of the new observatory at



F. W. A. Argelander,
German astronomer

Bonn, where his chief work was carried out. His survey of the northern heavens, known as the Bonn Durchmusterung or B.D., was a complete survey of the northern heavens mapped out into zones, extending from the north pole to two degrees S. of the equator. Argelander died at Bonn, Feb. 17, 1875. See *Durchmusterung*.

Argens, JEAN BAPTISTE DE BOYER, MARQUIS D' (1704–71). French philosophical writer. Born at Aix, Provence, and disinherited by his father, he retired to Holland. His writings attracted the notice of Frederick the Great, who invited him to Prussia and made him his chamberlain and director of the Academy. After twenty years, d'Argens fell out of favour and returned to Provence, where he died. In philosophy he was a moderate sceptic. He denied the freedom of the will and the existence of a soul-substance.

Argensola, BARTOLOMÉ LEONARDO DE (1562–1631). Spanish poet and historian. Born at Barbastro, Aragon, Aug. 26, 1562, and educated at the university of Huesca, he became chaplain to Maria of Austria, widow of the emperor Maximilian II. Attached

later to the suite of the count of Lemos, viceroy of Naples, he returned to Spain in 1616 and was made a canon of Saragossa, where he died Feb. 4, 1631. He left a continuation of Zurita's *Annals of Aragon*, a history of the conquest of the Molucca Islands, letters and satires, and poems (*Rimas*) which, published in 1634 with those of his brother, Lupericio,



B. L. de Argensola,
Spanish poet

*Print in Bibliothèque
Nationale, Paris*

caused their authors to be hailed as the Horaces of Spain.

Argensola, LUPERCIO LEONARDO DE (1559–1613). Spanish poet and dramatist. Born at Barbastro, Dec. 14, 1559, and educated at the universities of Huesca and Saragossa, he became secretary to Maria of Austria, chamberlain to the Archduke Albert, and historiographer royal of Aragon. His three tragedies, *Filis* (now lost), *Isabella*, and *Alexandra*, were praised by Cervantes.

Argenson, MARC RENÉ DE VOYER, MARQUIS D' (1652–1721). French official. Born at Venice, the son of a distinguished French advocate, he went to Paris in 1683, and was appointed lieutenant-general of the Paris police, under Louis XIV, in 1697. He filled this post for 21 years. In 1718 he was made president of the council of finance, but had to resign in 1720 on the collapse of John Law (*q.v.*). He was then made inspector-general of the French police. He died May 8, 1721.

Argenson, RENÉ LOUIS DE VOYER DE PAULMY, MARQUIS D' (1694–1757). French statesman. Elder son of the above, in 1719 he was made councillor of state, and in 1744 member of the council of finance and foreign minister. The friend of Voltaire and the philosophers, he endeavoured unsuccessfully to establish a European alliance of nations. He retired into private life in 1747, and was henceforth occupied with literary pursuits. He died Jan. 26, 1757.

Argenson, MARC PIERRE DE VOYER DE PAULMY, COMTE D' (1696–1764). French statesman. Younger son of the lieutenant-general of police, he was made councillor of state in 1724 and minister of war in 1743. He introduced important army reforms, and was present at the French victory at Fontenoy in 1745. He subsequently remodelled the French army on

Prussian lines. In 1757 he was banished from Paris at the instigation of Madame de Pompadour. The great French *Encyclopédie* was dedicated to him. He died in Paris, Aug. 22, 1764.

Argenson, MARC RENÉ MARIE DE VOYER DE PAULMY, MARQUIS D' (1771–1842). French soldier and politician. Son of the marquis de Voyer and grandson of the minister of war, he entered the army as an officer in 1789; he enthusiastically supported the Revolution, and was for a time aide-de-camp to Lafayette. In 1809 he was made prefect of Deux-Nèthes (Antwerp), and helped to drive the English from Walcheren. He was deputy for Belfort during the Hundred Days, and in 1830 represented Strasbourg as an advanced Radical. He died Aug. 1, 1842.

Argent (Fr., silver). In heraldry, one of the two metals, silver, also represented by white. It is shown in drawings by a plain surface. See *Tincture*.

Argentan. Town of France, in the department of Orne. It stands on the Orne, 31 m. by rly. N.W. of Alençon. Industries include lace making and horse raising. During the battles of 1944 heavy fighting developed around Argentan, which was reached by U.S. forces on Aug. 12. It became the southern "lip" of the Falaise (*q.v.*) gap, being captured, and the gap closed to the north of it, on Aug. 20. The church of S. Germain was severely damaged.

Argentario. Mountainous peninsula of Italy. Situated in the S. of Tuscany, it consists of two narrow strips of land enclosing a lagoon. On the headland stands the town of Orbetello. Its summit reaches 2,085 ft.

Argentera, PUNTA DELL'. Mt. of N.W. Italy, in Piedmont. It lies S.W. of Cuneo and N. of Nice and is 10,880 ft. high. It was first ascended in 1879. See also *Argentièrre, Col de l'.*

Argenteuil. Town of France, in the department of Seine-et-Oise, an important river port on the Seine, 7 m. N.N.W. of Paris, of which it is a suburb. Here was a convent of which Charlemagne's daughter became abbess and on which the emperor bestowed a garment said to be the seamless coat of Christ, still kept in the parish church. Héloïse took the veil in the convent here, where she had been educated, and S. Vincent de Paul founded a hospital.

Little of ancient Argenteuil remains except a round tower. Factories have swallowed up the

once famous vineyards, though a vintage feast is still held in Oct. Chief manufactures are machine-made embroideries, rubber and tires, motor cars and bicycles, papier-mâché, sulphate of quinine. Pop. (1954) 63,316.

Argentièrè, COL DE L'. Pass in the Maritime Alps, on the Franco-Italian frontier. It was crossed by Francis I and his army

in 1515. At the Italian end of it is the village of Argentera. It is on the road from Barcelonnette, France, to Cuneo, Italy, completed in 1870. It reaches an altitude of 6,545 ft. (*See also* Argentera, Punta dell'.)

There is a peak called Argentièrè, 12,820 ft., in the Mont Blanc range, towering over the village of Argentièrè in Haute-Savoie.

ARGENTINA: S. AMERICAN REPUBLIC

The physical features, constitution, social and industrial life, history, and arts of Argentina are here described. For more detailed information, see articles on Buenos Aires, Asunción, and other cities; José de San Martín, Hipólito Irigoyen, Domingo Perón, and other leaders; and on such physical features as Aconcagua, the River Plate, Tierra del Fuego

Argentina is the second largest country of the continent of South America in both area (1,078,266 sq. m.) and population (18,955,789 in 1952). It is roughly triangular in shape with a maximum width of 980 m. near its base on the frontier with Bolivia and Paraguay. This is 2,150 m. distant from the apex at the southernmost point of Tierra del Fuego, which is separated from the mainland by the Strait of Magellan. About the size of Europe without Russia, it is bounded on the E. by the Atlantic Ocean, Uruguay, and Brazil, on the W. by the Andes Mts., which form the frontier with Chile. Argentina lies between latitudes $21^{\circ} 40'$ S. and $55^{\circ} 5'$ S., and its climate varies from sub-tropical in the N. to antarctic in the S., where the prison settlement of Ushuaia, in Tierra del Fuego, is the most southerly inhabited spot in the world.

The country may be divided into five main regions:

(i) The Andine, which is the eastern slope of the Cordillera of the Andes, glacial in Patagonia, alpine in the picturesque district of the southern lakes in the province of Neuquén, richly fertile in the irrigated fruit and vine growing foothills of Mendoza, desert in the arid mountains of Tucumán, which merge into the windswept plateau of the extreme north-west:

(ii) The great sub-tropical forested plain of the Chaco in the N., which stretches over the boundary into Bolivia and Paraguay, and was the scene of the Chaco War of 1932-35;

(iii) The agricultural country called "mesopotamia," which lies between the rivers Uruguay and Paraná, and includes the provinces of Entre Ríos, Corrientes, and Misiones;

(iv) The treeless, fertile grasslands of the pampa, which extends in a flat, fanlike formation for 300-400 m. from Buenos Aires and includes the provinces of Buenos Aires, Córdoba, La Pampa, and Santa Fe, covering one-fifth of the whole area of Argentina and producing most of the cattle and grain of the country;

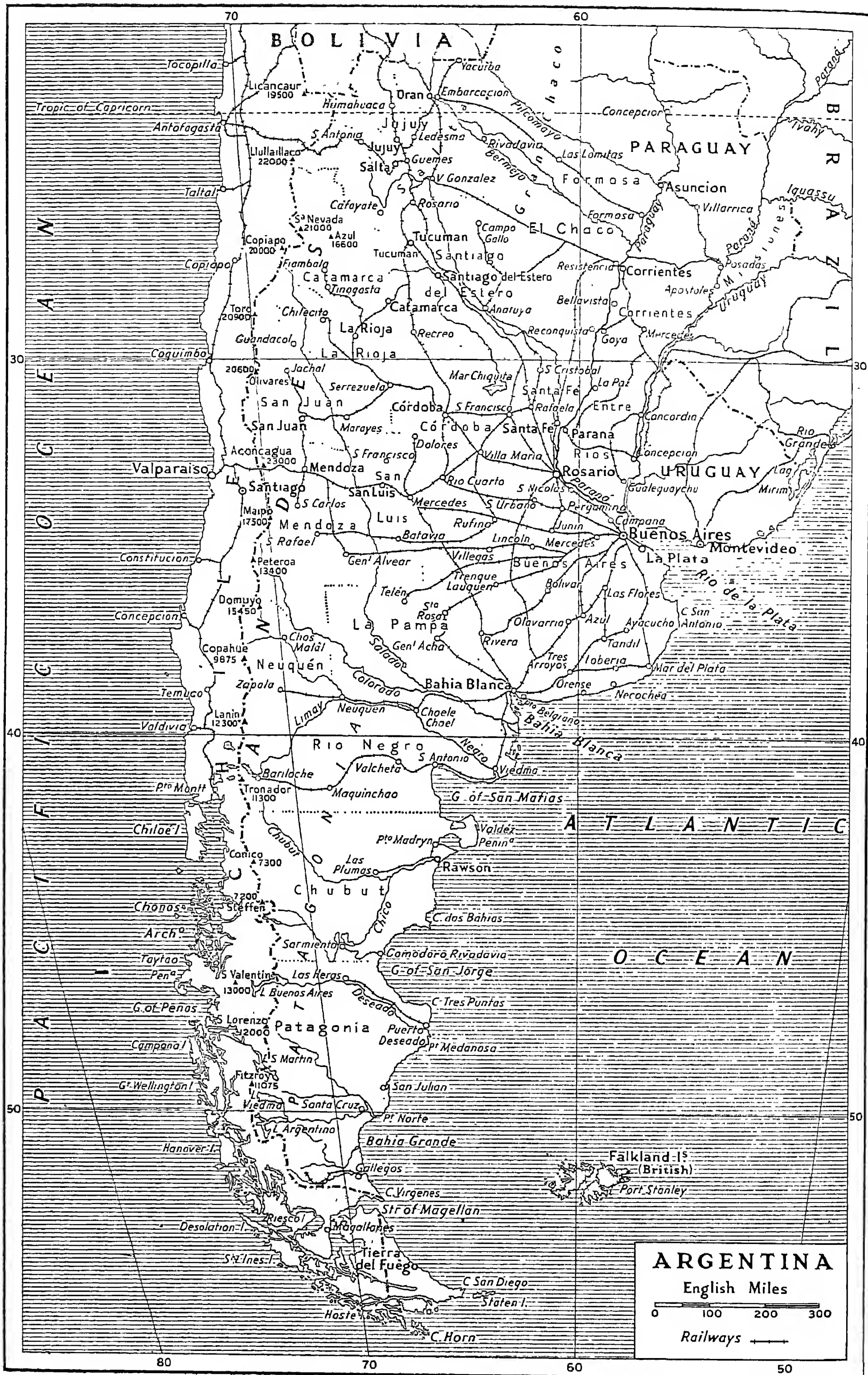
(v) The stony desert region of Patagonia, between the Río Colorado and the Strait of Magellan, devoted to sheep raising in the N., and providing the country's largest petroleum deposits, on the Atlantic seaboard and around Comodoro Rivadavia.

Aconcagua, in Mendoza, 23,000 ft., one of the peaks of the Andes, is the highest mountain in Argentina, and the second highest in the western hemisphere; but besides the great mountain chain of the Andes, there are smaller groups of hills, the most important of which is the Córdoba range (Sierra de Córdoba), rising out of the pampa and stretching 300 m. from N. to S. and 90 m. at its maximum width. Its highest peak is Champaqué, 8,500 ft. The Sierra del Tandil, a ridge of smaller hills running inland from the Atlantic for 150 m., lies 205 m. to the S.W. of Buenos Aires.

There is a further small range in Misiones, the last foothills of the great Brazilian escarpment, and here, on a tributary of the Paraná river, at the junction of Argentina with Paraguay and Brazil, are the 200-ft.-high Iguassu Falls, (nearly 40 ft. higher than Niagara), surrounded by a national park. Another national park, famous as a winter and a summer resort, lies round Lake Nahuel Huapi in the Argentine lake district of Neuquén and Río Negro provinces; it extends for 3,030 sq. m. and includes superb scenery. Mar del Plata, six



Argentina. Majestic sweep of the great Cordillera of the Andes Mountains which mark the frontier between Argentina and Chile. This view is of a locality between Mendoza and Santiago





Argentina. Typical estancia of the pampa : such a cattle ranching estate may well cover many square miles. Above (left), Gauchos drinking yerba maté tea ; (right) sacks of yerba maté being loaded at Puerto Mendes

hours by train S. of Buenos Aires, has five miles of beaches visited by more than half a million visitors during the summer season (Dec. to Easter). In the extreme N., on the Chilean border, there are various thermal centres, the most important of which is Rosario de la Frontera.

PRODUCTS. About a third of Argentina is forest land, 41 p.c. is natural or reclaimed grassland, 10 p.c. is cultivated, and the irrigated orchard land of the Andean foothills accounts for about 2 p.c. The remaining 14 p.c. is unproductive.

About 90 p.c. of the value of the country's export trade comes from animal and agricultural products, and most of this is produced from the pampa, where the soil and the climatic conditions are exceptionally good, in spite of periodic droughts and frosts, and, in the N., the menace of locusts. The economy of the zone depends on a careful balance between stock raising and grain production. *Estancieros* (ranch owners) lease lands to grain farmers for three to five years, after which it is sown with lucerne and returned to stock raising, while another tract is

leased for grain. If the cultivated areas are used for forage crops (oats, barley, rye, sudan grass) there is an increase in cattle raising at the expense of exportable crops of maize, wheat, and linseed. This happened in 1952, and, with the further incidence of acute drought, caused Argentina to import wheat for the first time within memory.

Government attempts to reverse this trend and to safeguard stock raising by more intensive cultivation, improved breeding, and the cleaning of the tick-infested lands on the northern fringe of the pampa so that they may support the Shorthorns, Herefords, and Aberdeen Angus strains which produce beef for export, were greatly stimulated by an increasing internal demand for meat, consequent upon a growing population with a rising standard of living; according to statistics for 1952-53, the country had about 45 million head of cattle.

Before the introduction of refrigeration, wool was Argentina's most important export, and in 1895 there were 74 million sheep. With the world-wide demand for frozen meat, sheep breeding

methods changed, and mutton-producing sheep raised in the province of Buenos Aires accounted in 1953-54 for a third of the estimated 55 million, when Argentina still was second only to Australia among wool exporting countries. The statistics for pigs increase and diminish as maize prices fall or rise. In 1952 there were nearly 4 million, mostly to supply local needs.

Beef and mutton are exported in refrigerated ships, either chilled (just above freezing point) when it must be eaten within 40 days of slaughter, or frozen solid, when it will keep almost indefinitely. All processes of meat canning are handled in the highly specialised and nationalised *frigoríficos*; the ten largest installations can handle 5,000 steers, 10,000 sheep, and 1,000 pigs in an eight-hour day. A by-product of the meat industry is the export, to the U.S.A. and Europe, of about 8 million cattle hides and 3 million calf-skins, annually, together with cattle, and pig and horse hair.

The importance of the horse began to decline with the coming of the railway, and again with

the mechanisation of cultivation. During 1930-53 the numbers fell from 10 to 7 millions, and the heavy Percherons, Clydesdales, and Shires were replaced by lighter breeds suitable for polo, racing, and riding.

Other products, principally for home consumption, are sugar, with its by-product industrial alcohol, in Tucumán, Salta, and Jujuy; dairy produce around the towns and in the Welsh colony round Rawson, in Chubut, where cheese is produced; yerba maté and tung in Misiones; rice in Corrientes, Entre Ríos, Santa Fe, Salta, and Tucumán; cotton in El Chaco; edible vegetable oils in Córdoba and Santa Fe; tobacco in Corrientes, Misiones, and Salta.

Fruit Growing

Grapes, cherries, peaches, plums, and apples are grown under irrigation in the Andean foothills in Mendoza, San Juan, and the valley of the Río Negro, and citrus fruit in the northern provinces of Jujuy, Salta, and Tucumán. Fresh fruit amounting to 97,374 tons was exported in 1952; fruit-drying and canning industries are continually diversifying their output; and the wine of the flourishing industry in Mendoza, San Juan, and Río Negro is improving under the advice of expert French vintners.

Before 1914 Argentine economy was almost exclusively based on pastoral and agricultural activities. Grain and meat were exported to Great Britain, the rest of Europe, and the U.S.A. in return for coal, textiles, clothing, machinery, motor cars, ships, locomotives, and luxury goods. Great Britain, whose economy was complementary, was the principal customer. As a result of two world wars, with consequent scarcity of consumer goods, Argentina began increasingly to foster home industries. But there is no hard coal, and when imports were cut off by war, railway engines burnt wood from the northern forests. The soft coal deposits in Patagonia were made accessible by the opening in 1951 of the 160-m. railway from Gallegos on the Atlantic seaboard to the coalfield. Production in 1951 was 109,926 tons, and it is estimated that the field will be an economic proposition by about 1975. Imports of coal, coke, and anthracite were 2,169,300 tons in 1951 and 1,703,700 tons in 1952, the decline being due, on account of drought, to lack of meat and grain for export.

Petroleum is obtained in some quantity from fields in Salta, Mendoza, and Neuquén; there are other deposits in the Gallegos valley. Comodoro Rivadavia, in Chubut, has the chief deposits. From this field natural gas is carried to the River Plate area through a 1,000-m. pipe-line which is joined at General Conesa by a tributary line from the Neuquén fields. A pipe-line from Yocuibá, in Salta, runs to the chief refineries at La Plata.

All iron and steel was imported until 1938, when 5,000 tons were produced. There are iron mines near Zapale in Jujuy, more than 1,000 m. by railway from Buenos Aires, and a blast furnace (under army authority) handles 18,000 tons of charcoal pig-iron annually. In 1952 about 50,000 tons of steel came from military engineering plants, and there was a private production of about 175,000 tons. There is a deposit of richer iron ore at Sierra Grande, 600 m. S. of Buenos Aires and near to the coast and cheap water transport to the industrial area of the River Plate. Total production in 1952 was estimated at 200,000 tons; completion of a projected new steel and coking plant at San Nicolás, between Rosario and Buenos Aires, was expected to bring Argentina's yearly output to 1,000,000 tons.

Developing Industries

During the years 1943-53 a light engineering industry was established in Córdoba for the production of motor cars, lorries, cycles, and tractors. Some locomotives are made at the General San Martín railway workshops in Mendoza. Compared with production in 1943, industry in 1953 had expanded roughly $2\frac{1}{2}$ times for metal, $1\frac{1}{2}$ times for machinery and vehicles, and $3\frac{1}{2}$ times for electrical machines and appliances. Manufacture of plastics, cement, and chemical and pharmaceutical products increased.

TRANSPORT. During 1941-51 the Argentine merchant fleet was established and passed a capacity of 1,000,000 tons, so that exports and imports were increasingly carried in Argentine bottoms, which also competed in the carrying of foreign cargoes. Internally, the country is served by road, river, railway, and air.

On account of the dearth of gravel or stone in the soil for surfacing, the roads are poor by European and U.S. standards; nevertheless good macadam and

bitumen roads link the capital with Mar del Plata and with Rosario and Córdoba; and the four main inter-provincial roads which make up the Argentine section of the Pan-American Highway were opened to traffic in 1942.

Rivers and Railways

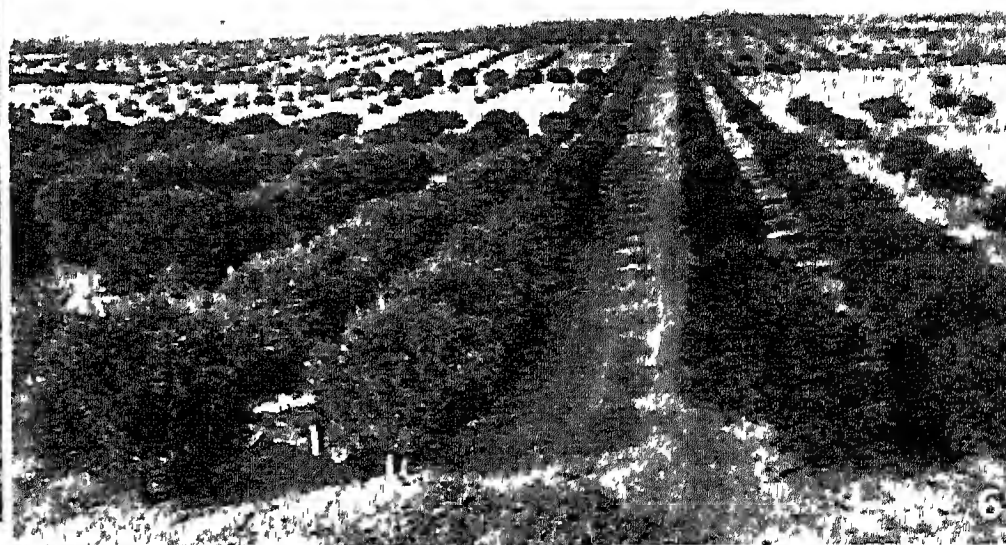
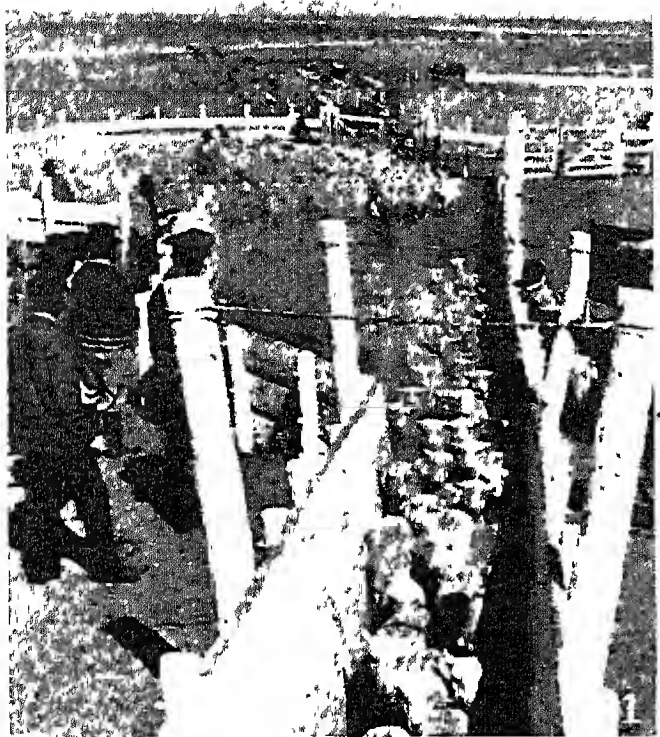
The Paraná and Uruguay rivers, which flow into the Plate, form an important artery of communication, navigable by ocean-going steamers as far as Rosario, Paraná, and Santa Fe. Smaller boats ply regularly to Corrientes and Asunción, while special flat-bottomed river steamers carry tourists as far as the Iguassu Falls on the Brazilian border. Rosario, once the second port and great grain distributor of the Argentine republic, has declined owing to the wheat shortage and the monopoly of Buenos Aires as a port of entry: in 1952 Buenos Aires carried ten times the tonnage of the hitherto busy La Plata.

The railways of Argentina are the most developed and best in the whole of South America. They were built and equipped in the main by British capital and engineers, and were British-owned until the Argentine government bought them in 1948 with the sterling balances which the country had accumulated during the Second Great War. Shortage of exportable rolling stock from abroad, and of further foreign exchange for its purchase, resulted in deterioration and considerable over-usage of the existing stock and track by a rapidly increasing population.

In addition to the internal network which links the principal towns, there are four international railways: (i) through Entre Ríos, Concordia, and Posadas to Asunción in Paraguay; (ii) through Tucumán, Jujuy, and La Quiacha to La Paz in Bolivia; (iii) through Mendoza to Santiago de Chile; and (iv) through Salta to Antofagasta in N. Chile. A line connecting Bahía Blanca on the Atlantic with Concepción on the Pacific seaboard of Chile was under construction in 1956.

Argentina's internal air lines, which connect the principal towns, were nationalised and amalgamated in 1949. International air services link Buenos Aires with Europe, North and Central America, and the other countries of South America.

CONSTITUTION. The Argentine constitution is based on that of the U.S.A. Since its inception



1. Flock from a sheep-run being driven through a boarded lane into the sheep train. 2. Wool wagons in Chubut. 3. Cattle on the pampa. 4. Inspecting meat for export in a frigorifico. 5. Packing grapes for export.

6. Extensive plantation of mandarin orange-trees and vines. 7. Part of a prosperous lakeside farm in the Territory of the Río Negro, S. Argentina; in the background can be seen the great range of the Andes.

ARGENTINA : PRODUCE OF RANCH AND PLANTATION IN THIS LAND OF PLENTY

Photos 4, 5, 6, Argentine Ministry of Agriculture

in 1853, it has been several times revised, notably by the Péron govt. in 1949 when the national constituent assembly ratified considerable changes and additions in the direction of social security, agrarian reform, and state ownership of mineral deposits, natural resources, and public services.

The constitution prescribes a bicameral legislature: (i) a chamber of deputies consisting of one representative per 100,000 inhabitants (if the number left over from this division is 50,000 or more, there is an extra deputy for this group); deputies are elected for six years and are eligible for re-election; half the chamber is renewed every three years, retirements being decided by lot; (ii) the senate, also elected for six years, consisting of two members from each province and two from the capital; one-third is renewed every three years. The vice-president of the republic is president of the senate.

After reorganizations in 1955, Argentina was divided into 22 provinces and the federal capital. The provinces were Buenos Aires, Catamarca, El Chaco, Chubut, Córdoba, Corrientes, Entre Ríos, Formosa, Jujuy, Mendoza, Misiones, Nequén, La Pampa, La Rioja, Río Negro, Patagonia, Salta, San Juan, San Luis, Santa Fé, Santiago del Estero, and Tucumán. (The province of Patagonia was created in 1955 from the former territories of Santa Cruz and Tierra del Fuego.) The provinces are autonomous for all domestic affairs. The federal government at Buenos Aires deals with foreign affairs, higher education, and all matters affecting the state as a whole.

President's Powers

Executive power is vested in the president, who must be Argentine-born and a Roman Catholic. He is elected for a six-year term by a simple majority vote, and is thereafter eligible for immediate re-election. (The interval of six years formerly necessary was abolished, along with the electoral college, by the 1949 constitution.) The president is commander-in-chief of the armed forces, and the general administrator of the country, appointing, with senate approval, ambassadors, ministers, senior officers of the armed forces, and bishops. He has sole control over the appointment and dismissal of cabinet ministers and consular officials; he may also, with senate approval, appoint an

official to take over the government of any province, or any economic activity; and he may suspend constitutional guarantees by declaring a "state of siege" in times of crisis.

Voting is obligatory for all citizens over the age of 18; women were given the franchise in 1947. The ballot is secret. There is a supreme court which deals with cases of national significance or those involving foreigners; and subsidiary tribunals in all provinces and territories which handle local cases. The judges of the supreme and lower courts are appointed by the president with the approval of the senate. Foreigners may apply for citizenship after two years' residence, and, unless they declare an objection, automatically become naturalised after five years.

Nationalised Services

The Central Bank was nationalised in 1946. Railways, air services, merchant marine, telegraphic and port facilities, grain elevators, and, within the capital, gas and transport are also nationalised. In Aug., 1950, two basic rates of exchange were established: 14.00 pesos to the £1 sterling for basic exports (excluding wool) and for imports of essential fuels; and 21.00 pesos to the £1 for all other priority imports and for exports of manufactured goods and processed food. In addition, there was a "free market" rate of 38.96 pesos to the £1 for other transactions (with prior permission from the Central Bank).

RELIGION AND EDUCATION. The majority of the people of Argentina are Roman Catholics; but the constitution allows freedom of religion, and churches of other denominations exist. Teaching of religion in schools, abolished in 1884, was reintroduced after the Perón revolution of 1943; education was again secularised in 1954. Also in 1954 divorce was made legal; and in 1955 Perón abolished the status of the R.C. Church as state church.

Illiteracy steadily decreased with the introduction of free and compulsory education. By 1914 it had been reduced to 35 p.c.; in 1945 to 16.6 p.c. over the whole country and 7.7 in the city of Buenos Aires. There are some 15,000 primary and 1,000 secondary schools under the ministry of education. The curriculum of private schools is controlled either by the national or by the provincial authorities.

The oldest university, founded 1613, is at Córdoba. Others are at Buenos Aires, La Plata, and Tucumán; and there are the national universities of El Litoral and Cuyo. These universities have earned high standing in Latin America and are well endowed with up-to-date laboratories and specialised libraries. There are also schools for industrial training, arts and crafts, commercial training, rural economy, and for the training of teachers. Institutes exist in the large towns where advanced instruction is given in the fine arts, decorative arts, music, and languages. The ministry of agriculture provides rural schools where practical agriculture is taught.

PEOPLE. There are a very few pure-bred Indians left in the mountains of the N.W., the Chaco, and S. Patagonia, and western settlements along the foot of the Andes show some traces in their mestizo population of their early colonisation from Chile, Peru, and Paraguay, but this only amounts to two p.c. over the whole country. Two-thirds of the total population live in the city and province of Buenos Aires, and these people are almost wholly of European extraction. In 1914 one-third of the whole population was of foreign birth, in 1940 one-fifth, in 1950 one-sixth.

The European settlers have made the pattern of Argentine life on the groundwork of the Creole society descended from the early Spanish settlers. The U.K. and the U.S.A. have influenced the material development of the country with films, plumbing, refrigeration, meat packing, telephones, the comic strip, railways, banks, shipping, pedigree stock, gardens, and football; Germans trained the army and also created large banking and shipping interests; but the Italians, Spanish, and French have made the climate of opinion, and the cities in particular, up to the outbreak of the First Great War, were French in outlook, culture, and manners.

Argentine Culture

After 1943 there was a growing accent on Argentine culture and education. Argentinians have a strong regional sense, enhanced by the differences of climate and terrain in their vast land. People in Buenos Aires and the other big cities live in a different world from people of the hinterland; those of the pampas, with the horse and cow as their principal domestic animals, have a com-

pletely different horizon from the mountain folk, with their llamas and goats. In the north the schools close for three months in the year because of the heat, and in the south for three months because of the cold. In S. Patagonia the word "summer" means that it is daylight for most of the 24 hours, but never warm, and there are no flowers.

HISTORY. The River Plate was discovered in an attempt to find a new western route to Asia, and was navigated in an attempt to find alternative access to the "mountain of silver" and Potosí, instead of the hazardous 3,000-m. journey on foot across what is now Brazil, and the Chaco, to Bolivia. Solís made the first landing in 1516, and was killed by Indians. Magellan entered the estuary in 1520, but turned S. to discover a way into the Pacific through the strait that bear his name and commemorates his voyage. Cabot and García sailed up the Paraná and Paraguay rivers and made a settlement called Sancti Spiritus, later wiped out.

In 1536 (N.S.), Pedro de Mendoza, equipped with a large force of men, horses, and provisions, founded the first settlement at Buenos Aires. It was thought that the first sight of men on horseback would so intimidate the Indians that they would capitulate, but they brought the horses down with their weapon, the bolas, and the settlement was destroyed and horses and cattle were turned loose to become wild herds of the pampa. These, and not silver, became the foundation of Argentina's wealth.

One of the followers of Mendoza sailed up the Paraná and settled, together with his men, in Asunción, where the Indians, already subjected by Inca rule, were less ferocious than the Pampas and Guaranis of the south. Meanwhile Pizarro had conquered Peru, and Spain lost interest in the "silver river" since the contents of the Potosí mines could now be exported from Puerto Bello on the Isthmus of Panama.

First Permanent Settlement

It was from Asunción in 1580 that Juan de Garay re-formed the settlement at Buenos Aires, which was firmly established by 1614 under Hernando Arias de Saavedra. Towards the end of the 16th century, expeditions from the viceroyalty of Peru and from Chile established the first Argentine towns among the eastern foothills of the Andes: Santiago del Estero,

Tucumán, Córdoba, Salta, La Rioja, Jujuy, San Juan, Mendoza, and San Luis.

Owing to Spain's strict maritime laws Buenos Aires lived for 270 years after its foundation by smuggling hides, tallow, and salt beef, obtained from the wild herds that roamed the pampa by the Indians and the gauchos (descendants of the first settlers and captured Indian women), who brought them into the town and sold them to the *contrabandistas*.

Río de la Plata Viceroyalty

In 1776 a viceroyalty of the Río de la Plata was formed which included Argentina, Uruguay, Paraguay, and Bolivia, and in 1778 Spain raised the embargo on exports. Emboldened by their defeat of the attempted British invasion of 1806, the Porteños (natives of Buenos Aires) deposed the viceroy on March 25, 1810. On July 9, 1816, in face of the threat of invasion by viceregal forces from Peru, and a Spanish blockade of the Río de la Plata (River Plate), the rebels declared their independence at Tucumán, and consolidated it by the success in arms of the national hero José de San Martín (1778-1850).

Thereafter a struggle for control between a centralised government in Buenos Aires and the supporters of local autonomy, aided by the great landowners and gauchos, lasted until 1853, when, at the downfall of the dictator Rosas, federation was recognized in the constitution. But the province of Buenos Aires seceded and civil war persisted until 1861, when Bartolomé Mitre was made the first president of the federal government at Buenos Aires.

The supremacy of the capital was confirmed through the defeat of the Indian tribes of the pampa by Julio Roca (1843-1914). This inaugurated the peaceful settlement of the pastoral and later agrarian economy upon which the fortune of the country still depends. The dividing up of the pampa into great estancias among Roca's officers in recognition of their services gave rise to the system of rule by a landed oligarchy that persisted until 1943. The *estancieros* employed first the gauchos and later, as the rearing of cattle became more specialised, European immigrants, of whom there were more than six million during 1857-1930. During the same period there was increasing investment of foreign capital in the country, mostly British. After

the outbreak of the Second Great War in 1945 the U.S.A. became the chief supplier of foreign capital.

The first radical president of Argentina, himself a large landowner, was Hipólito Irigoyen (c. 1855-1933). He was elected in 1916 under the laws providing for universal (male) suffrage and the secret ballot passed in 1912 during the presidency, 1910-14, of Roque Sáenz Peña (1851-1914). Irigoyen introduced minimum wage laws and an eight-hour day, fixed rents, and improved workers' housing. His successor, 1922-28, Marcelo Torcuato de Alvear (1868-1942) continued this liberal programme and promoted the period of the greatest prosperity the country has known. The world depression of 1929-33, and the failure of Irigoyen's leadership during his second term of office, led to a conservative reaction which was paramount until the revolution of 1943 ushered in the Peronista regime.

Peronista Regime

Juan Domingo Perón (b. 1895), leader of the National Labour party, and of the Peronist Radicals, attained the presidency in 1946 in the first elections held since 1938. A new constitution was introduced, and the Central Bank, railways, internal air-lines, and some shipping were nationalised. In 1947 women were given the vote, and a special tax on employers was introduced for the benefit of state-aided industries. A general election held in 1948 was boycotted by opposition parties. An act of 1949 recognized the legality of all existing parties, but made them liable to dissolution by government decree. Perón, re-elected for a second six-year term in 1952, was driven into exile by a military revolution, Sept., 1955, headed by General Eduardo Lonardi (1896-1956), in his turn deposed two months later by General Pedro Eugenio Aramburu.

During Perón's regime there was an improvement in the condition of the workers, a deterioration in that of the landowners; much constructional work was undertaken, accompanied, however, by censorship of press and radio, serious inflation and exhaustion of foreign exchange reserves, and suppression of all democratic opposition.

LANGUAGE. The people of Argentina speak Spanish. But naturally in a continent the size of Latin America, there are many variations in the types of Spanish

spoken, and the Argentine variety, judged by Castilian standards, is poor. Argentina is notable for its pronunciation of the "ll." For instance, in Spain, and in the more northern Spanish-speaking countries of Latin America, the pronunciation of the word for street, *calle*, is "cahye," whereas in Argentina, it is pronounced "cahje." As is to be expected in a land where the population is made up of people of very various European origins, many words not used in Spain or any other Spanish-speaking country of America have crept by common usage into the Argentine variety of Spanish.

LITERATURE, ART, ETC. Until the end of the 1930s Argentina was the cultural leader of Latin America. Outstanding names in its literature and intellectual life are: Esteban Echeverría (1805-1951), a romantic poet whose greatest work was *La Cautiva*, 1837; José Mármot (1818-1881), author of the novel *Amalia*; Bartolomé Mitre (1821-1906), journalist (founder of the daily newspaper *La Nación*), poet of nature, and a leading historian of S. America; Juan Bautista Alberdi (1810-1884), diplomat, journalist, and prolific writer of prose; Domingo Sarmiento (1811-1888), statesman, educator, poet, and author of *Facundo*, a socio-political biography of the lieutenant of the dictator Rosas; José Hernández (1834-1886), who wrote *Martin Fierro*, the great book of primitive gaucho life in Argentina; Estanislao del Campo (1835-1880), who wrote a burlesque poem, *Fausto*, in gaucho dialect; and Ruben Dario (1867-1916), who, though born in Nicaragua, spent most of his life in Argentina, and whose influence on modern Spanish verse has been profound.

Twentieth-Century Writers

In the 20th century the best-known Argentine novelist is Hugo Wast (Gustavo Martinez Zuviria, b. 1883), whose popular novels have been translated into many languages. The greatest poet, essayist, and publicist was Leopoldo Lugones (1874-1938). A novelist and historian whose works have been translated into many languages is Ricardo Rojas (b. 1882); another well known historian is Ricardo Levene (b. 1885). A poetess of outstanding merit was Alfonsina Storni (1892-1938). An Argentine academy of letters, founded 1921, has a membership limited to 20.

Of Argentina's two world famous newspapers, *La Prensa*, known for its high literary standards and independent views, is owned by the family of the founder, José C. Paz (1842-1912), who started it in 1869 (it was appropriated by Perón in 1951, restored to Gainza Paz 1956); *La Nación*, a paper with a strong R.C. policy, was founded in 1870 by Bartolomé Mitre.

During the 19th century native music was for the most part confined to folk dances, including the pericón (a native country dance) and the tango. The ever-growing number of European musicians visiting Argentina helped to create a local school of music. The best known composers are Julian Aguirre (1869-1924) and Alberto Williams (1862-1952), the "grand old man" of Argentine music. The fine Colon Opera House in Buenos Aires was modelled on the Scala at Milan.

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Argentina, LA. Stage name of Antonia Merée (1890-1936), Spanish dancer. Born in Buenos Aires, Sept. 4, 1890, she went to Spain at the age of two with her parents, who became members of the company of the Madrid Royal Opera House. Argentina joined the company at the age of five. At eleven she was a première danseuse. Later, moving to Paris, she became internationally famous.



Argentina, Spanish dancer famed for the precision of her footwork and spirited playing of the castanets.

Her performances of Spanish dances and her playing of the castanets were unrivalled. She toured Europe and America, appearing regularly in London from 1931, where her *Danse Rituelle du Feu* became specially popular. She died at Bayonne, July 18, 1936.

La Argentina was instrumental in reviving Spanish classical dancing and in popularising the music of Albéniz, Granados, and Falla.

Argentine Pass.

Pass in the Rocky Mts. In the state of Colorado, U.S.A., near Denver, it reaches just over 13,000 ft.

Argentinita, LA. Stage name of Encarnación Lopez (1898-1945), born in Buenos Aires, who was acclaimed in Spain for her Spanish dancing, worked in ballet in New York, and collaborated with García Lorca in 1932 in the founding of the Madrid ballet.

Argentite. One of the principal ores of silver. It is the source from which much of the silver is obtained in the mines of Germany, Bohemia, Hungary, Mexico, and Nevada. A sulphide, it has a composition of about 86.5% silver and 13.5% sulphur. It is always found combined with other sulphides, particularly those of copper and lead.

Argentorum. Latin name for Strasbourg. Most of the books printed at Strasbourg during the 15th-17th centuries bear the impress Argentorum.

Arges. River of Rumania. Rising in the Transylvanian Alps, it flows for 150 m. S. and S.E. to the Danube below Oltenitsa.

The battle of the Arges was fought Nov. 30-Dec. 3, 1916, between Austro-German forces under Falkenhayn and Mackensen and the Rumanians under Avarescu. It resulted in a heavy defeat for the Rumanians and their evacuation of Bukarest, occupied by Mackensen on Dec. 6.

Arghana Maden. Town of Turkey, in Elazig vilayet. On the river Tigris, 50 m. N.W. of Diarbekir, it has an old and very rich copper mine.

Argives (Greek *Argeioi*; Lat. *Argivi*). Inhabitants of Argos in Greece. Homer used the term for the Greeks in general.

Argob. Hebrew name for the district containing threescore cities ruled by Og king of Bashan (Deut. 3; 1 Kings 4). Called by the Greeks Trachonitis (Luke 3), it is usually identified with the modern El Lejah. Described as an ocean of basaltic rocks and boulders, it is studded with deserted towns and ancient villages. See Palestine.

Argol. Crude acid potassium tartrate deposited from wine. When grape juice ferments the acid potassium tartrate ($\text{KHC}_4\text{H}_4\text{O}_6$), which it contains naturally, is deposited because it is less soluble in the alcohol which results from the fermentation process. Argol is deposited as a crystalline crust on the sides of the vat, and when this is recrystallised it is known as tartar; from this, by further purification, cream of tartar is obtained.

Argol occurs in commerce as red argol and white argol, according as it is deposited from red or white grapes. From argol tartaric acid ($\text{H}_2\text{C}_4\text{H}_4\text{O}_6$) is made by neutralising it with whiting and afterwards boiling with calcium sulphate. This forms calcium tartrate and potassium sulphate. The latter is separated out by crystallisation and the calcium tartrate treated with sulphuric acid.

Argolis. A district of ancient Greece. Occupying the N.E. part of Peloponnesus, bordering the Gulf of Aegina or the Saronic Gulf, and the Argolicus Sinus or Gulf of Nauplia, it was the territory surrounding Argos. It became part of the Roman prov. of Achaea in 146 B.C. It has many legendary associations, including that of the Lernean Marsh, where Hercules slew the Hydra. Argolis is a nome or department of modern Greece. Its capital is Nauplia. Pop. (1951) 85,289.

Argon (Gr. *argos*, inert). One of the gases which go to make up the atmosphere. It exists in the proportion of nearly 1 p.c. of air.

At the meeting of the British Association in 1882 Lord Rayleigh mentioned that he had begun a research on the densities of hydrogen and oxygen, and in the experiments he found that the density of nitrogen varies according as it is prepared from the atmosphere or from ammonia. In 1893 chemists were asked to make suggestions to account for this difference. Sir William Ramsay took up the work and adopted the method, devised by Cavendish nearly a century before, of removing the oxygen from air by means of an electric discharge. He also called attention to a remark by Cavendish that there ap-

peared to be a small amount of nitrogen differing from the rest in that it could not be reduced to nitrous acid. He devised a method of removing the nitrogen from air by employing magnesium metal and an electric current, and in this way collected a fairly large amount of the residue. Tested by the spectrum method of analysis, the residue gave a different spectrum from that of nitrogen. This proved that a new gas had been discovered, and it was named argon, and the fact published at the meeting of the British Association in 1894.

Argon is an inert gas, and attempts to make it combine with other elements have failed. Sir James Dewar has liquefied and solidified it. Argon is now prepared with comparative ease from the air, provided it is not required in a state of absolute purity.

Argon is used in many types of electric lamps and display signs and in geiger counter tubes. Its chemical symbol is A, atomic weight 39.9; atomic number 18; boiling point -186°C .

Argonaut. Cuttle fish of the genus *Argonauta*. The beautifully ribbed, translucent shell is secreted



Argonaut, or paper nautilus. The upper figure shows the animal swimming

by the flat expansions of two of the arms, or tentacles, of the animal, and it is not attached in any way to the body. Its object is to serve as a receptacle for the eggs. The argonaut is common in the tropic seas: one species, the paper nautilus, inhabits the Mediterranean.

Argonauts (Gr., sailors of the Argo). In Greek mythology, the heroes who, under the leadership of Jason, sailed to Aea or Colchis, on the Black Sea, in search of the Golden Fleece. They were so called from the name of the 50-oared ship Argo which was built by Argos,

Jason was the son of Aeson, who had been deprived of the kingship of Iolcus in Thessaly by his half-brother Pelias. To get rid of Jason, Pelias suggested to him that he should fetch the Golden Fleece, which hung in the sacred grove of Mars at Colchis.

Aetes, king of Colchis, agreed to surrender the Fleece to Jason provided he tamed two fire-breathing oxen with feet of brass, and with them ploughed a two-acre field. He was then to sow the teeth of a dragon, which would produce a crop of armed men, who had all to be destroyed. Finally, he had to kill the dragon guarding the Fleece.

By the help of the magic powers of Medea, the king's daughter, who fell in love with him, Jason succeeded in fulfilling all the conditions, obtained the prize, and started home, taking with him Medea and her young brother Absyrtus. They were pursued by Aetes, but Medea delayed the pursuit by murdering her brother and scattering his limbs in the sea, so that the father would have to pick them up for burial. Zeus in rage sent a storm: the ship declared that the expedition must visit Circe in Ausonia before it could be purified. After evading the fatal allurements of the Sirens, and escaping the perils of Scylla and Charybdis, the voyagers eventually returned to Iolcus.

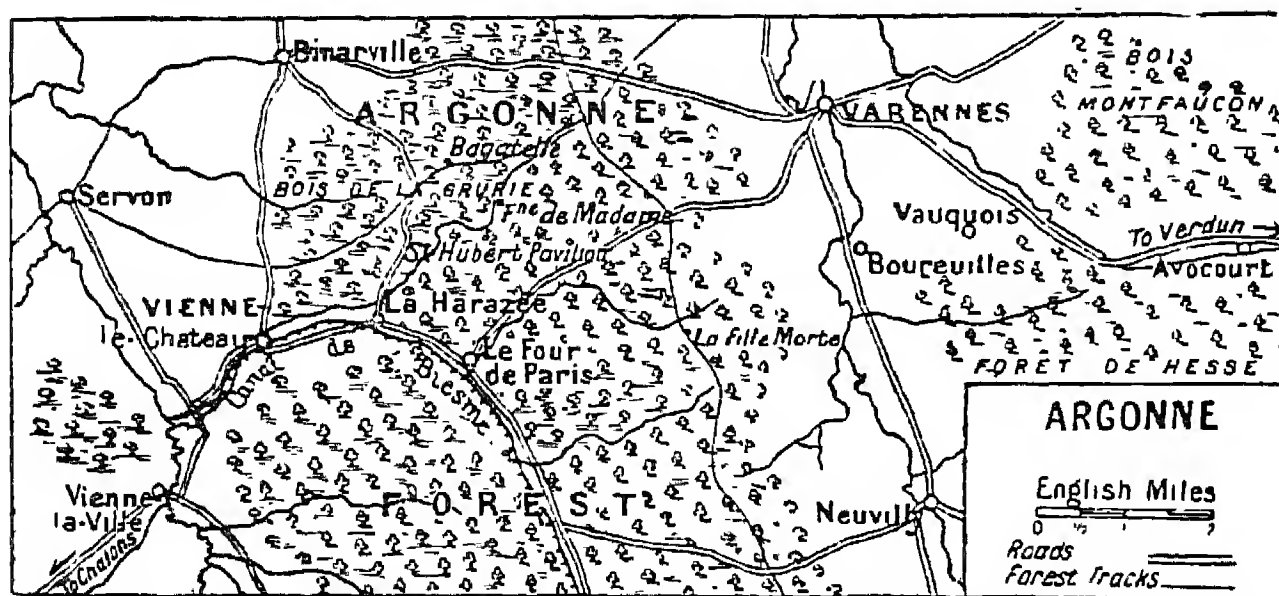
The voyage of the Argonauts is the subject of a Greek poem by Apollonius of Rhodes and of a Latin adaptation by Valerius Flaccus, and is described in Kingsley's *The Heroes*. See Jason; Medea.

Argo Navis OR THE SHIP ARGO. One of the southern constellations, most of which lies below the English horizon. It is so vast that, for convenience of reference, it has been subdivided into four minor groups: Pyxis, the compass; Vela, the sails; Puppis, the stern; and Carina, the keel. It contains 15 stars brighter than the third magnitude, among them Canopus, which is next in brightness to Sirius. See Constellations.

Argonne. District in E. France, known from its wooded character as the forest of Argonne. It covers part of the departments of Ardennes and Meuse, and lies between Toul and Mézières, being a stretch of high ground between the basins of the Meuse and the Aisne. About 10 m. wide from east to west and 40 m. long from north to south, it is densely covered with undergrowth and intersected with ravines.

Argonne, CAMPAIGNS IN THE. Series of operations in the First Great War. The Argonne owed its strategic importance to the fact that a successful advance through it by the Germans would have turned Châlons and Verdun and rendered the French front on the Meuse untenable.

The German Crown Prince with the 5th German army passed



Argonne. Map of the forested area through which the Germans menaced Verdun in 1914 and 1915, and through which the French and Americans drove back the invaders in the closing stages of the First Great War

through the Argonne in the first advance of Aug.-Sept., 1914, and by him Varennes was many times taken and relinquished. During the winter the two entrenched forces were in close contact parted by only a few yards of almost impenetrable bush, barbed wire, and concealed machine-gun posts. In Jan., 1915, the French failed in an effort to storm Bourguilles. In Feb. a fierce struggle opened for the strongly fortified village of Vauquois half of which was captured by the French.

In June, 1915, the German staff determined to make a thrust through the Argonne with about 80,000 men. French positions were heavily bombarded with gas-shells, and between June 20 and July 2 a series of assaults was delivered. About mid-July the battles ended in a virtual stalemate, the French holding all the vital positions.

In the autumn of 1918 Foch, as supreme Allied commander, resolved to clear the Argonne. His force included 22 U.S. divisions with a total strength of 631,000 men (though only 3 divisions had taken part in previous operations); together with 4 French divisions comprising 138,000 troops, including artillery. On the German side 46 divisions were employed.

The U.S. attack opened on Sept. 26 on a front of 18 m. Close cooperation of artillery could not be given, the U.S. staff having put its main trust in telephones and the lines being cut by German artillery fire. Other difficulties hampering the Americans were the lack of roads and light railways; and, as always, the mud. By Oct. 4 the advance totalled only 7 m. But the Germans were at no time strong enough to counter-attack, and on Oct. 29 Marwitz the German commander, fell back on the W. bank of the Meuse and blew up his ammunition dumps. By Nov. 2 the whole Argonne

region was cleared and an advance of 16 m. accomplished. American casualties in the battle numbered 115,529, including 15,599 killed. French casualties were 7,000.

Argos. City of ancient Greece. In Argolis, 3 m. inland from the head of the Gulf of Nauplia, and said to be the oldest city of Greece, it became the nucleus of a kingdom, with Mycenae as its capital. From being the predominant state, it fell in the 7th century B.C. under the influence of Sparta, but remained independent until conquered by the Romans in 146 B.C. Many remains have been excavated, including those of the Heraeum or temple of Hera, which contained a gold and ivory statue of the goddess. The modern Argos a flourishing town and a junction on the rly. from Corinth to Tripolis, has remains of its cyclopean walls and rock-hewn amphitheatre. Pop. (1951) 14,728.

Argostoli. City and seaport of the Ionian Islands, Greece. The capital of the island of Cephalonia, it stands on the eastern shore of the Gulf of Argostoli, and had a good harbour and a naval school. It had a shipbuilding industry, exported currants, wine, and oil. It was almost completely destroyed by an earthquake in 1953. Pop. (1951) 8,724.

Argosy. Term used, generally figuratively, in the sense of a richly laden ship. Though popularly connected with the vessel Argo in which Jason bore off the Golden Fleece (see Argonauts), the word was said in the 17th century to be derived from Aragouse, a corruption of Ragosie, i.e., a ship from the wealthy port, Ragusa.

Argot. French term for slang. It is applied to the colloquial language of general society; the special vocabulary of a class, community, profession, or calling; and—the earliest meaning—the jargon of thieves, rogues, and vagabonds. French slang dates

back to the 14th or 15th century, and may have originated among thieves, among the gipsies just appearing, among students, or in the motley gatherings at the great medieval French fairs. The 15th century vagabond-poet François Villon, was the first to use slang in literature, and some of his poems are written entirely in argot.

Argument (Latin *arguere*, to prove). That part of a proof on which rests its validity or power of convincing. The term is often used in the sense of argumentation (demonstration of the proof of something). Arguments may be demonstrative, based upon absolute, necessary truths; or dialectic, based upon relative, contingent propositions, which cannot produce conviction. The *argumentum ad hominem* (to the man) is an argument addressed directly to an opponent, based on his own previous actions or admissions. *A priori* arguments have their origin in reason, *a posteriori* are deduced from experience.

Argun. River of Asia. It rises in the W. of Manchuria and flows mainly N. between that country and Siberia, and unites with the Shilka at Ust-Stryelka to form the Amur. Its length is about 500 m.

Argus. In Greek mythology a being with 100 eyes, of which only two slept at a time. Hera appointed him guardian of Io, whom Zeus had changed into a heifer, but all his eyes were lulled to sleep by the lyre of Hermes. Hera thereupon put his eyes on the tail of a peacock, the bird sacred to her. Argus was also the name of the dog of Ulysses, who died from joy when his master returned after an absence of 20 years.

Argus Pheasant. Species of pheasant found in Malaya and Sumatra. It is notable for the extra-



Argus Pheasant, bird of beautiful plumage. It is a native of Malaysia

ordinary length of the tail feathers and for the beautiful, eye-like spots on its plumage.

Argyle, PEARL (1910-47). British dancer. Born at Johannesburg, Nov. 7, 1910, she studied dancing under Marie Rambert in London. From 1930 to 1931 she danced in three seasons of ballet with Karavina at the Lyric Theatre, Ham-



Pearl Argyle. British dancer, member of several famous ballet companies

mersmith, and appeared in C. B. Cochran's *Helen* at the Adelphi Theatre, 1932. Her performances in *Carnaval*, *Aurora's Wedding*, and *L'Après-midi d'un Faune* reached a brilliant level at the Mercury Theatre in 1934. In 1935 she joined the Sadler's Wells company. She died Jan. 28, 1947.

Argyll, EARL AND DUKE OF. Scottish titles borne since 1457 and 1701 respectively by the family of Campbell. Duncan Campbell of Loch Awe was a lord of Scotland about 1400; his grandson Colin was 1st earl. Archibald, 2nd earl, was killed at Flodden. Archibald, son of the 9th earl, recovered the titles and estates after the Revolution of 1688, and for helping William III was rewarded in 1701 with a dukedom. John, the 2nd duke, served at Malplaquet. John the 5th duke, the second husband of Elizabeth Gunning (*q.v.*), was made a baron of Great Britain in 1766. The 8th and 9th dukes are noticed separately below. In 1949 the titles and estates passed to the 11th duke, Ian (b. 1903), who succeeded a cousin.

The duke is hereditary master of the royal household in Scotland, keeper of the great seal of Scotland, admiral of the western isles, and keeper of the castles of Carrick, Dunoon, and Dunstaffnage. His chief seat is Inveraray Castle. The eldest son is usually known as the marquess of Lorne, and the dukedom has been since 1892 a peerage of the United Kingdom. Readers of Macaulay's *History*, Scott's *Legend of Montrose*, and Stevenson's *Catriona* will know of the power once wielded by the dukes in the W. Highlands.

Argyll, ARCHIBALD CAMPBELL, MARQUESS OF (1598-1661). Scottish soldier. As Lord Lorne he began as a young man to administer the estates of his Roman Catholic father. In 1638 he became the 8th earl; and with the quarrel between Charles I and the Covenanters coming to a head, both sides were anxious to secure his aid. A dour Presbyterian. Argyll acted as a military leader of the Covenanters in 1639. Though made a marquess by the king, in the Civil War he took up arms against Montrose and the Royalists, who defeated him at Inverlochy, Feb. 2, 1645. He fled to England, but returned to power and associated himself with Cromwell. After the execution of the king, he changed sides again and crowned Charles II at Scone in 1651. Commonwealth soldiers marched on Inveraray and after a siege the marquess submitted. Found guilty of treason by the Restoration parliament, he was beheaded in Edinburgh, May 27, 1661.

Argyll, ARCHIBALD CAMPBELL, 9TH EARL OF (1629-85). Scottish soldier. Eldest son of the above marquess, he fought at Dunbar for Charles II, but submitted to Cromwell in 1655. On refusing to renounce allegiance to the Stuarts he was imprisoned. Released at the Restoration, he was warmly received by Charles, and in 1663 the title of earl and the estates of his father were given back. Through protesting at the harshness employed against the Covenanters, 1671, he fell into disfavour, and in 1681 was tried for treason. After a travesty of justice Argyll was condemned, but escaped from prison to Holland. There he met Monmouth and agreed on the proposed invasion of Britain. He landed in Scotland, but the cause failed. Taken prisoner, he was beheaded in Edinburgh, June 30, 1685, under the sentence of 1681.

Argyll, GEORGE DOUGLAS CAMPBELL, 8TH DUKE OF (1823-1900). British statesman and writer. Born April 30, 1823, he succeeded to the title in 1847 and came quickly into prominence in the House of Lords. In 1853 he was made lord privy seal under Aberdeen, and from 1855-58 was postmaster-general. In the Whig ministry of 1859-66 he was again lord



George Douglas Campbell, 8th Duke of Argyll

privy seal, and was secretary for India, 1868-74. In 1880 Gladstone made him lord privy seal, but he resigned next year, disapproving of the Irish land bill. Later he bitterly opposed Gladstone's Home Rule measure, but the estrangement was healed when both appeared in public on behalf of the Armenians. The duke died April 24, 1900. He wrote *The Reign of Law*, 1867; *The Eastern Question*, 1879; *Our Responsibilities for Turkey*, 1896. *Consult Autobiography and Memoirs*, 1906.

Argyll, JOHN DOUGLAS SUTHERLAND CAMPBELL, 9TH DUKE OF (1845-1914). British politician. He was educated at Eton, St. Andrews, and Trinity College, Cambridge. As the marquess of Lorne he married in 1871 the Princess Louise (1848-1939), fourth daughter of Queen Victoria. During 1878-83 he was governor-general of Canada. He was Liberal member of Parliament for Argyllshire 1868-78, and Liberal Unionist member for S. Manchester 1895-1900. He succeeded to the dukedom and estates in 1900, and died May 2, 1914.

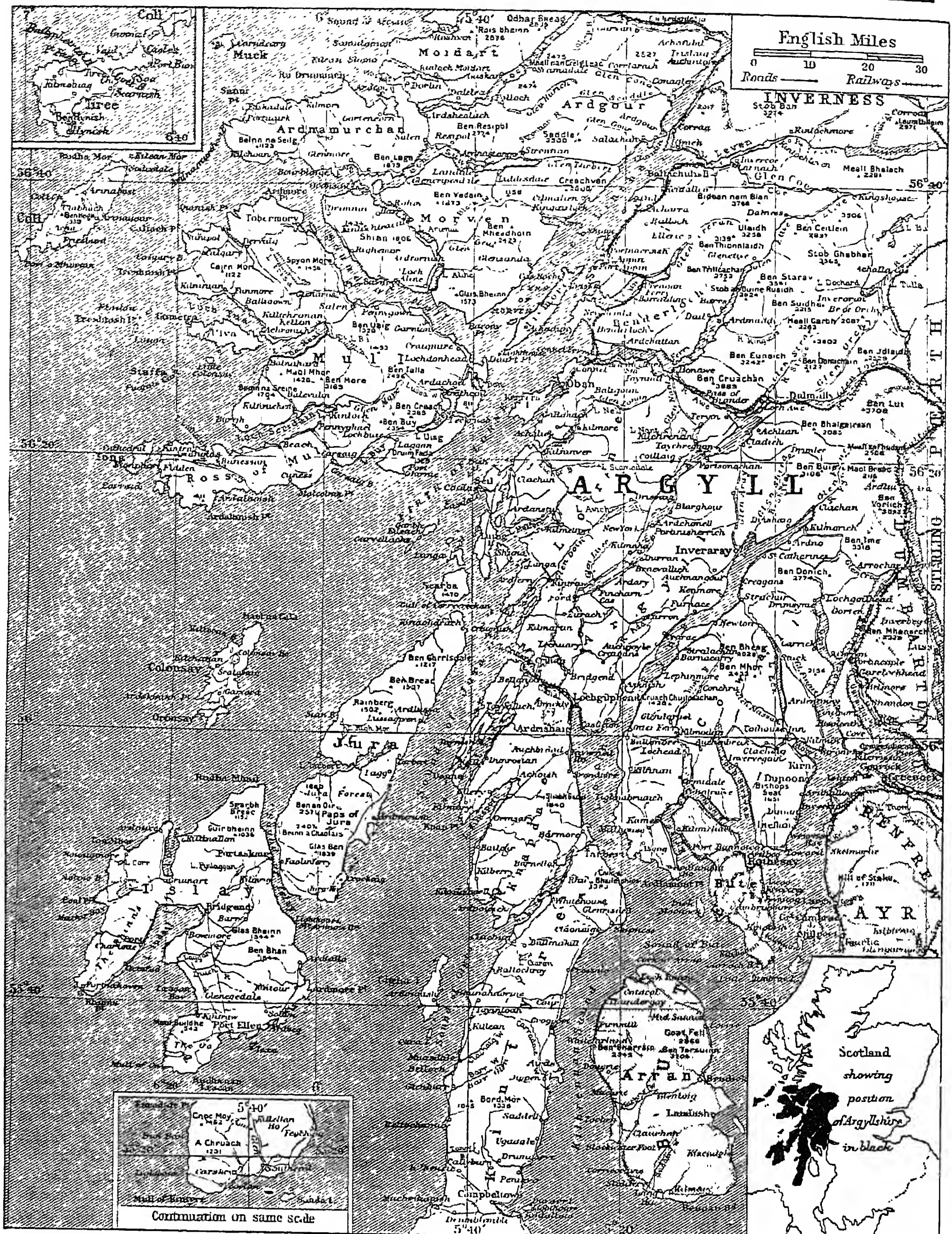
Argyll and Sutherland Highlanders. Kilted regiment, a union of the old 91st (Argyllshire High-



A. and S. Highlanders' badge

landers) and the 93rd (Sutherland Highlanders). The former was raised in 1794 by the duke of Argyll, and the latter by the earl of Sutherland in 1800. The old 91st specially distinguished itself in the Peninsular War, and formed part of the rearguard at Corunna. The 93rd won renown at the Alma and Balaklava. A detachment of the 91st was on board the *Birkenhead* when she was wrecked in 1852. The regiment bore an honourable part in quelling the Indian Mutiny, and in the S. African and the two Great Wars. A battalion formed the rearguard for the withdrawal to Singapore from Malaya, 1942. Other battalions served in Tunisia, notably at Longstop Ridge, April, 1943, and with the B.L.A., crossing the Rhine with the Highland division (*q.v.*).

Argyll Rooms. Fashionable London pleasure resort in the early part of the 19th century. Originally a large house in Little Argyll Street, London, W., it was bought by a Colonel Greville and converted into a place of public entertainment, where masquerades, balls.



Argyllshire. Map of the westernmost county of Scotland. Ardnamurchan Point in this county is the most westerly portion of the mainland of Britain. The county is cut up by many lochs and bays into peninsulas and islands

and concerts took place. Rebuilt by John Nash, the premises were burnt down while in the occupation of M. Chabert, known as "the fire king," Feb. 5-6, 1830.

Argyllshire. Western maritime and second largest co. of Scotland.

It includes most islands of the Inner Hebrides, the principal being Mull, Islay, Jura, Tiree, Coll, Lismore, Colonsay, and the small and picturesque islands of Iona and Staffa. Its greatest length is 114 m., extreme breadth 55 m., and

area 3,110 sq. m. The co. is served by the Scottish Region of British Railways, and by the Crinan Canal, which connects Loch Fyne with the Sound of Jura. The coast measures more than 2,000 m. and is broken by

many sea-lochs (Linnhe, Fyne, Moidart, Sunart, Long) and land projections (Ardnamurchan, Morven, Kintyre).

The surface is generally rugged and mountainous (Bidean nam Bian 3,766 ft., Ben Cruachan 3,689 ft., Stob Ghabhar 3,565 ft., Ben Ime 3,318 ft., Ben More 3,169 ft.), with low-lying coast districts. Loch Awe is the largest lake, and the chief streams, short, rapid, and unnavigable, are the Orchy and Awe. Sheep and cattle rearing and herring and salmon fishing mainly engage industrial attention less than 10 p.c. of the land being under cultivation. Slate is quarried at Easdale and Ballachulish, coal is worked near Campbeltown, and granite and limestone are also found. Strontian was formerly noted for its lead mines. In Islay and at Campbeltown there are whisky distilleries, and Kinlochleven has a large aluminium works. Inveraray is the co. town: Campbeltown, Dunoon, Oban, Lochgilphead, and Tobermory are next in importance. Argyllshire is a co. constituency. Pop. (1951) 63,270.

Argyrokastron (Albanian, Gjinokaster). Town of Albania. Called Ergeri or Ergi by the Turks when it formed part of the vilayet of Janina, it is an important centre of N. Epirus. It lies about 50 m. N.W. of Janina, on the E. declivity of the Acroceraunian Mts. on a tributary of the Vijose. It is noted for its snuff. It was occupied by the Greeks in 1916, and later by the Italians. During the Italo-Greek war (1940-41) the town became the main Italian forward base in South Albania, but was captured by the Greeks on Dec. 8, 1940. But they withdrew when Greece was invaded by the Germans in April, 1941; and only in 1944, when the Germans abandoned their hold upon Albania, was Argyrokastron freed. Pop. 10,836, mostly Greeks.

Ariadne. In Greek mythology, the daughter of Minos, king of Crete. Theseus, on his arrival in Crete with the tribute of young men and maidens to be devoured by the Minotaur, was shown by Ariadne how to find his way out of the labyrinth, the monster's dwelling-place, by means of a ball of thread. He took Ariadne away with him, but deserted her on the island of Naxos while she slept. Here the god Dionysus (Bacchus) took her to wife, and set her crown among the stars; or took her away by force from Theseus when they landed. In Homer, Ariadne was killed by Artemis on her arrival at

Naxos: in another account, she slew herself when abandoned by Theseus. Ariadne was a nature goddess, whose desertion by Theseus and marriage to Dionysus may symbolise the death and revival of vegetation in winter and spring respectively.

Aria Form. Term applied to music constructed after the formula A-B-A. A represents one section more or less complete in itself, sometimes repeated; B is a new section, for contrast; and a recapitulation of A, entire or modified, completes the aria. This form, in embryo, is found in popular airs such as "Charlie is my darling."

Ariana OR ARYANA. Ancient division of Asia. In the widest sense it comprised the territory peopled by Aryans lying between the Tigris on the W. and the Indus on the E.

Arianism. Name given to the doctrine, maintained by Arius in the 4th century, denying that Christ was equal to or was of the same substance with God the Father. The doctrine may be traced to the teaching of Paul of Samosata, but was first systematised by Arius, a priest of Alexandria, and Athanasius was its great opponent.

The controversy had become acute by 323, and in 325 the Council of Nicaea condemned Arius and formulated the earliest published declaration of the Catholic Faith—the Nicene Creed, in which the decision of the Council is to be found, with a few verbal differences, down to the words "in the Holy Ghost." All the bishops but two subscribed to the decision. Eusebius of Nicomedia subscribed, but altered the (Greek) word *homo-ousion* = of one substance with, into *homoi-ousion* = of a similar substance. Words of anathema were added to the declaration.

But Arianism was not extinguished. It was in the ascendant even under Constantius II (reigned 337-361) and Valens (364-378), but, Theodosius I declaring for Athanasianism, the second great council of the Church, held at Constantinople, 381, restored the authority of its predecessor of 325. Divided among themselves, the Arians declined in numbers and influence within the Roman empire. Meanwhile, however, the heresy spread among the West Goths, whose adoption of Arianism was one of the conditions of their settlement in Thrace; the East Goths in Italy, the Vandals in Africa, the Suevi in Spain, the Burgundians in Gaul,

and the Lombards in Upper Italy, until its fate was sealed by the triumph of the Franks under Clovis, who was baptized at Reims in 496. It reappeared in Europe in the 16th century in Poland, and in England from Henry VIII to James I there were executions for Arianism. Today it may be traced in the forms of Unitarianism, Socinianism, and Deism. Arianism was not compatible with the doctrines of the Trinity and the divinity of Christ. See Arius; Athanasius.

Ariano Irpino. Town and episcopal see of Italy, in Avellino province. It stands among the Apennines, 17 m. E.N.E. of Benevento, and deals in hemp, linen, pottery, oil, wines, and cereals. It has spinning mills and alcohol factories, and there are gypsum mines in the neighbourhood. Pop. (1951) 26,988. The town was formerly called Ariano di Puglia.

Arica. Northernmost seaport of Chile. In Tarapaca prov., 39 m. by rly. S. of Tacna in Peru, it is the terminus of the rly. across the Andes to La Paz, of which it is chief port of entry. Taken by Chile from Peru in 1880, it was long the subject of dispute, but Chilean possession was amicably confirmed, on the arbitration of the U.S., by an agreement at Lima, 1929. Exports include copper, silver, gold, iron, salt, sulphur, guano, borax. Pop. (est.) 30,000.

Arichat. Seaport of Nova Scotia, Canada. The capital of Richmond county, and the seat of a R.C. bishop, it stands on the S. side of Madame Island.

Aricia. One of the oldest cities of Latium, standing on the Appian Way, 16 m. S.E. of Rome. Opposing Rome, it was conquered by C. Maenius in 338 B.C., being subsequently granted full rights of citizenship. The modern town of Ariccia lies to the N.

Ariège. A department of S. France. It is bordered on the S. by the Pyrenees, of which it includes some of the highest peaks, and is watered by the Ariège and the Salat. Agriculture, the cultivation of the vine, and the mining of iron and other minerals are the chief industries. Foix is the capital. The area is 1,892 sq. m. Pop. (1954) 140,010.

Ariel. Dainty sprite who waits on Prospero's commands in Shakespeare's comedy *The Tempest*. Although the name is of Hebrew origin, Ariel is the delicate, gossamer-winged fairy of English folk tales. Throughout the play Ariel voices a longing for freedom and at last is restored to

the liberty of the unchartered elements. Shakespeare gives Ariel three exquisite fairy songs: Come unto these yellow sands, Full fathom five thy father lies, and Where the bee sucks, there suck I. In Milton's *Paradise Lost* (vi, 371) Ariel is one of the fallen angels, and in Pope's *Rape of the Lock* a sort of fairy lady's-maid to Belinda. See *Tempest*, *The*.

Ariel. Man of Moab whose two sons were slain by Benaiah, son of Jehoiada (2 Sam. 23: 1 Chron. 11,

aria, frequently without definite second and third sections. See *Aria*.

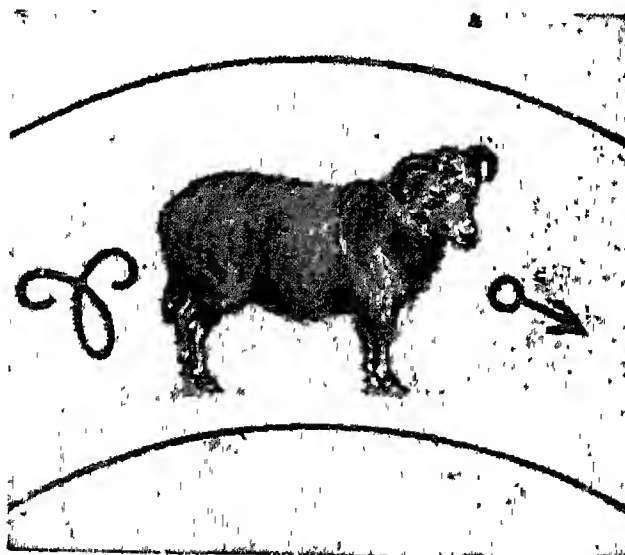
Aril (late Latin *arillus*, dried grape). Flethy coating to certain seeds, arising from the placenta. The best examples are found in the "mace" that encompasses the nutmeg, and the orange-coloured wrapping of the seed that helps to make opened seed-vessels of the spindle-tree so conspicuous.

Arimaspi. Mythical people of Scythia. They are referred to by Herodotus (iv, 13, 27) as dwelling to the E. of the Caspian Sea. Pausanias describes them as all one-eyed men from birth, constantly at war with the griffins guarding the gold of the river Arimaspius, probably in the Altai district of Russia. Aeschylus makes them inhabitants of Africa. Cf. Milton, *Paradise Lost*, ii, 943: The Arimaspi, who by stealth Had from his [the griffin's] wakeful custody purloined The guarded gold.

Arimos. A river of Brazil. It rises in the Arimos plateau of Matto Grosso, and flows nearly 700 m. N.N.W. to join the Tapajos, tributary of the Amazon.

Ariosto, Ludovico (1474-1533). Italian poet. Born Sept. 8, 1474, at Reggio, of an ancient and noble Bolognese family, Ariosto devoted five years to the study of jurisprudence, which he abandoned on discovering his vocation for poetry. In 1503 he became one of the attendant gentlemen to Cardinal Ippolito d'Este. He neither neglected his duties nor abandoned his poetry, and after ten years completed 24 cantos of the epic poem that brought him fame, the *Orlando Furioso*, first published in 1516 and designed as a sequel to Boiardo's *Orlando Innamorato*. In the third

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Aries, or the Ram, one of the twelve signs of the Zodiac

edition (Ferrara, 1532) the poem appeared in an enlarged form and assumed its final proportions. His other writings include five comedies and some graceful sonnets.

After serving the cardinal faithfully for 14 years Ariosto was dismissed without further reward, but soon after joined the household of the cardinal's brother Alfonso, duke of Este. In 1522 the poet undertook, with success, to quell a rebellion in the Garfagnana province, of which he later became governor, but after three years returned to Ferrara. He died June 6, 1533, and was buried in the Church of San Benedetto, Ferrara, where a handsome monument was erected to his memory. Eng. translations of the *Orlando*: Sir J. Harington, 1591; T. H. Croker, 1755; W. Huggins, 1757; J. Hoole, 1773-83; W. S. Rose, 1823-31. See *The King of Court Poets*, E. G. Gardner, 1906; *Life and Genius of Ariosto*, J. S. Nicholson, 1914.

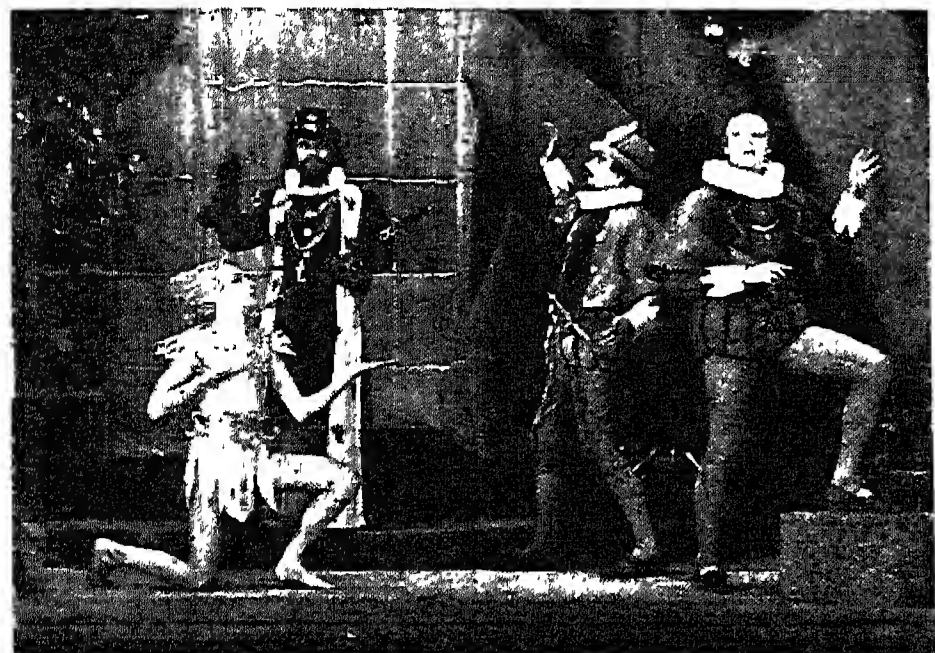


Ludovico Ariosto
Portrait by Titian

Ariovistus. A German chief, mentioned in Caesar's *Gaulic War*. In 61 B.C. he crossed the Rhine with his followers to help the Sequani against the Aedui, whom he defeated. He received in return Sequanian territory in Alsace, but continued his attacks on the Gauls. The Aedui begged Caesar for help and in 58 B.C. Caesar advanced into Alsace and defeated Ariovistus, driving him back across the Rhine.

Arisaig. District of Inverness-shire, Scotland. It lies between Lochs Ailort and Morar, and is partly covered by a deer forest. The village of Arisaig is 34 m. N.W. of Fort William. Pop. (1951), with Moidart, 1,002.

Arish, EL. Harbour of Egypt. It stands on the Mediterranean, about 50 m. S.W. of Gaza and is on the caravan route from

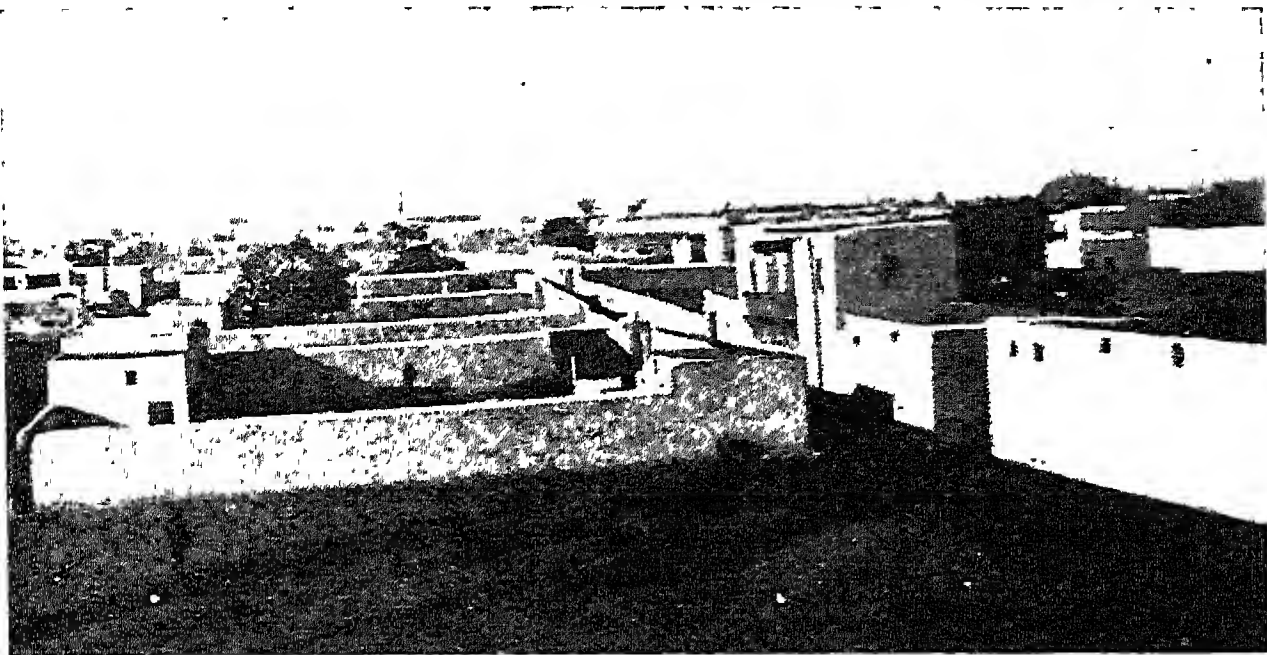


Ariel casts a spell at the bidding of Prospero. Dennis Hutchinson as Shakespeare's dainty sprite in a Stratford-on-Avon production of *The Tempest*, 1938

R.V.). The name occurs on the Moabite stone in allusion to an altar, is used as the name of a man in Ezra 8, and applied symbolically to Jerusalem in Isaiah 29, and in the Hebrew of Ezek. 43 to the altar of burnt offerings. The word means lion, or altar, of God.

Aries (Lat., ram). One of the twelve signs of the Zodiac. Through it the sun passes on its annual round, and it was associated in Greek mythology with the voyage of the Argonauts in search of the Golden Fleece. Aries is an important but small constellation close below the greater W that lies beneath the smaller W of Cassiopeia's Chair. It can also be found by following the stars which mark the belt of Andromeda. The only bright stars in the constellation—usually known by their Arabic names—are the three on the Ram's head. Alpha is known as Hamal, which is Arabic for Ram, and Beta and Gamma bear the names Sheratin, the two signs, and Mesartin, the two attendants. The "first point of Aries" is the point of the heavens at which the sun annually crosses the Equator at the vernal equinox. Owing to the precession of the equinoxes, this point is now actually in the constellation Pisces, but is still conventionally called the first point of Aries. See *Zodiac*; *Precession*.

Arietta (Ital., little aria). In music, a short and less important



Arish. View of the Egyptian town as seen from the S.E. From here in the First Great War the British constructed a railway into Palestine

Beersheba to Egypt. It was taken by Napoleon in 1799 and during the First Great War was occupied by the Turks, from whom it was captured by the British on Dec. 21, 1916. The advance of the British troops was facilitated by the construction of a rly. to this point, since extended over the Palestine border and as far as Haifa.

Arista, MARIANO (1802-1855). Mexican general. Born at San Luis Potosí, July 26, 1802, in 1846 he took command of the Mexican army of the north in the war with the U.S.A., but, being defeated at Palo Alto (May 8) and Resaca de la Palma (May 9), he was recalled. War minister in 1848, he was president of Mexico in 1851-53, and, resigning, was banished to Europe. He died at sea, Aug. 7, 1855.

Aristaeus. In Greek mythology, son of Apollo and the nymph Cyrene. He was the protector of flocks and herds, of shepherds, and of vine and olive plantations. In Virgil's *Georgics* (iv) he is connected with the story of Orpheus and Eurydice (*q.v.*).

Aristagoras (d. 497 B.C.). Tyrant of Miletus in Caria. He persuaded Darius, king of Persia, to aid him in an attack on Naxos, but the expedition miscarried. Fearing the wrath of Darius, who hoped to obtain possession of the island, Aristagoras stirred up the Greek cities of Asia Minor to revolt against Persia. Having obtained aid from the Athenians, the combined forces marched on Sardes, which was captured and burnt. Unable to hold the city, the Greeks, deserted by the Athenians, were forced to retreat to the coast, and their cities passed again under Persian rule. Aristagoras fled to Thrace, where he was killed shortly afterwards while fighting against the wild tribes of the country.

Aristarchus of SAMOTHRACE (c. 220-145 B.C.). An Alexandrian grammarian and critic. He was a pupil of the grammarian Aristo-

phanes of Byzantium at Alexandria, where he founded a critical and grammatical school and superintended the education of the children of Ptolemy VI Philometor. When his pupil, Ptolemy Physcon, who had usurped the throne, began to persecute men of learning, Aristarchus fled to Cyprus, where he is said to have starved himself to death.

He devoted his labours to the explanation and restoration of the text of the most important Greek poets. His great work was his recension of the *Iliad* and *Odyssey*, which is the basis of all subsequent texts. In this he made use of critical marks to indicate spurious or interpolated passages.

Aristarchus of SAMOS. Greek astronomer, who lived in the third century B.C. He is said to have been the first to state that the earth moved round the sun.

Aristeas (c. 550 B.C.). Greek poet. A native of the island of Proconnesus. His poem, *Arimaspeia*, contained an account of his travels on the north coast of the Black Sea and of the Arimaspi (*q.v.*) and other similarly fabulous peoples.

Aristeides OR **ARISTIDES** (c. 550-467 B.C.). An Athenian general and statesman, surnamed the Just. After the first Persian War, in which he fought with distinction at Marathon, he opposed the policy of Themistocles, who regarded the creation of a fleet as the best bulwark against Persian aggression. The differences between them became so acute that in 483 ostracism (*q.v.*) was resorted to, as a result of which Aristeides had to go into exile. He did good service, however, in the second Persian War, with a force raised by himself privately, and in 479 commanded the Athenians at the battle of Plataea. When, owing to the arrogance of Pausanias, the states of Greece, which had formerly

looked to Sparta as their leader, transferred their allegiance to Athens, and the Delian league was formed, Aristeides was chosen to organize the league, and to determine the contribution of each state. In domestic politics, though an aristocrat by birth, Aristeides, recognizing that the spirit of the times demanded it, was responsible for the further democratisation of the Athenian state. He improved the political status of the *Thetes*, the fourth and lowest class of citizens, and was in favour of admitting all classes to the archonship. In 467 he died in such poverty that there was not enough money to pay for his funeral.

Aristeides OR **ARISTIDES** (fl. 360-330 B.C.). Greek painter. A native of Thebes, he excelled in the rendering of expression and emotion, though his colouring is said to have been rather harsh. His most famous picture represented a mother suckling her child though mortally wounded, her face depicting her anguish lest the infant should draw blood instead of milk. Attalus, king of Pergamum, paid 100 talents (£20,000) for one of his pictures.

Aristeides OR **ARISTIDES** (2nd century B.C.). Greek writer. He was the author of *Milesiaca*, scenes of Milesian life, which, translated into Latin, was very popular among the Romans.

Aristeides OR **ARISTIDES**, **PUBLIUS AELIUS** (c. A.D. 129-189). A Greek rhetorician, born in Mysia. Trained by famous rhetoricians and literary men, he travelled and lectured. The citizens of Smyrna owed to him the rebuilding of their city after its devastation by an earthquake, the result of an appeal to his friend, the emperor Marcus Aurelius. Aristeides' extant works consist of two treatises on rhetoric and a number of speeches.

Aristippus (c. 435-360 B.C.). Greek philosopher. A native of Cyrene, he was the founder of a school of philosophy, hence called *Cyrenaic*. He taught that happiness was to be found in the enjoyment of the present, to the neglect of all considerations of the past or the future, but that for the truest enjoyment of what lay to hand the cultivation of wisdom was essential. The doctrines of Epicurus were a development of this teaching. Aristippus was one of the pupils of Socrates and was the first to seek payment for his teaching. See *Cyrenaics*.

Aristochin. Tasteless form of quinine. Chemically carbonyl quinine, it is made by acting on quinine with phosgene gas. See *Quinine*.

Aristocracy (Greek *aristos*, best; *kratos*, government). Term meaning originally the rule of the best men. Today, however, it is used in a somewhat different sense, meaning not a system of government, but a class of men and women distinguished from their fellows by superior birth or position. By an extension such terms as aristocracy of intellect and aristocracy of wealth are used.

In its older sense the word was used by Aristotle to define one of three forms of good government: monarchy, aristocracy, republic. He contrasted aristocracy with oligarchy; both mean the rule of the few, but in one the few rule solely with regard to the public welfare, and in the other they do not. Government by an aristocracy has been fairly common in the history of the world, although perhaps it would be more correct to describe most of such governments as oligarchies; they were certainly the rule of the few, but it is questionable whether they were the rule of the best. Some of the city states of ancient Greece,

especially Sparta, perhaps enjoyed the nearest approach to real aristocratic government known, but that of Venice was an oligarchy. An aristocratic government may be also the rule of a single man, provided that man is the best man—for instance, the philosopher king of Plato's Republic. The 19th-century antithesis in the popular mind between aristocracy and democracy, government by the few against government by the many, has in the 20th century been overshadowed by the antithesis between parliamentary government and new forms of dictatorship.

Aristogiton. Friend of Harmodius (*q.v.*).

Aristolochia (Gr. *aristos*, best; *locheia*, childbirth). Large genus of shrubs and perennial herbs. It includes about 300 species, chiefly natives of tropical regions, especially S. America. Birthwort (*A. clematitis*) is European and, having in the past been cultivated for medicinal use, has long been naturalised in England. It has heart-shaped leaves and yellow flowers.

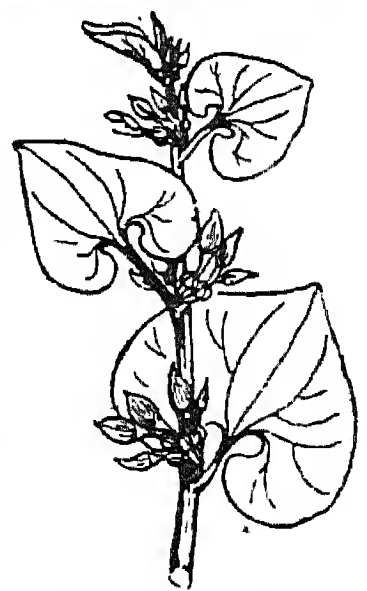
Dutchman's Pipe (*A. sipho*) is a N. American climbing shrub, with yellow-brown flowers the shape of which has suggested the popular name. Snake-root (*A. serpentina*) has a reputation as

a cure for snake-bite in America.

Aristolochiaceae. Dicotyledonous family of climbing shrubs and herbs of tropical and warm temperate regions of the world except Australia. They have irregular flowers consisting of a dull-coloured calyx with 6 to 36 stamens and a solitary pistil. The lower part of the flower is inflated, and this portion in some species acts as a trap for flies, which are made use of as agents in cross-fertilisation. The two principal genera are *Aristolochia* (Birthwort) and *Asarum* (see *Asarabacca*).

Aristophanes (c. 445–385 B.C.). Athenian dramatist. A supreme comic genius, he was born in Athens. He lived for a time and owned property in Aegina, which gave his rivals opportunity to call him a foreigner. Fifty-four comedies in all were attributed to him, 11 of which survive. His first comedy was produced in 427 B.C., and the second edition of the *Plutus* (considered the link between the Old Comedy and the New of Menander) in 388. He was conservative in his ideas, the Athens of the Persian Wars being his golden age. The newer Athens was distasteful to him; he disliked the growth of democracy and the rationalistic attitude towards religion and morals associated with the Sophists.

His earlier comedies, such as *Hippes* (the knights), *Nephelai* (the clouds), and *Sphekes* (the wasps) contain most violent personal attacks upon those who in his eyes stood for the tendencies he deplored, especially the demagogue Cleon and the philosopher Socrates, whom he unjustly identified with the Sophists. Cleon tried unsuccessfully in the law courts to call in question the citizenship of Aristophanes, who appears to have learned caution, for his plays during the next period of his dramatic career, such as *Ornithes* (the birds) and *Batrachoi* (the frogs).



Aristolochia clematitis, or Birthwort



Aristeides (c. 550–467 B.C.) accosted by a peasant who, not knowing him, wished him to write the name of Aristeides as one to be ostracised—because he was tired of hearing him called The Just. See p. 585

After a painting by E. E. Hillemacher, Dijon Museum

in the second of which Euripides is held up to ridicule, were much less outspoken, while in his last personal satire almost disappeared.



Aristophanes,
Greek dramatist
Capitol, Rome

the Old Comedy as contrasted with the Middle and the New

Many comedies derived their names from the creatures which the chorus were dressed up to represent, e.g. *The Wasps*, *The Birds*, *The Frogs*. Aristophanes is the chief representative of what

In spite of his strong political convictions, Aristophanes lacks any constructive notions of his own. He is primarily a comedian. Though many of his allusions are unintelligible owing to our ignorance of contemporary conditions, his work can be appreciated and enjoyed by the modern reader. His humour is irresistible and his wit unfailingly brilliant. Not only was he a supreme comic genius; for beauty and delicate fancy some of his lyrical passages challenge comparison with those of Shakespeare. There is a spirited English verse translation by B. B. Rogers, Loeb Classical Library, 1924. Consult Aristophanes, Gilbert Murray, 1933; *The People of Aristophanes*, V. Ehrenburg, 1943.

for his province, and by dint of sheer assimilative capacity, coupled with scientific insight, presents to the world a veritable encyclopedia of science, learning and philosophy.

Most of the works ascribed to Aristotle have perished. Among the lost books are letters, speeches, poems, philosophical dialogues, treatises on national festivals and dramatic contests, and manuals of natural history and rhetoric. It is on these lost works that Aristotle's fame as an accomplished stylist was founded. What has survived are not his highly finished literary efforts, but lectures and treatises of a technical and academic order. Intermediate between the two classes is *The Constitution of Athens*, one of 158 similar surveys published in 1891 from a papyrus found in Egypt. Altogether the extant works, though forming not more than a fifth of the total output, serve to indicate the amazing range of the author in virtue of which Dante might well salute the Stagirite as the "master of those who know."

The Theory of Teleology

The large portion of the *corpus* occupied by works on natural science and natural history, now covered by the special sciences of astronomy and the like, suffers from the limitations of all early research. Even so the three works, *The History of Animals*, *On the Parts of Animals*, and *On the Generation of Animals*, have elicited from the greatest scientists unstinted praise. Of crucial importance is the theory of teleology, expounded most fully in *De Anima*. There Aristotle asserts that not only human life, but animal and plant life also, are dominated by a soul dwelling in every creature, preserving the material body from decay and determining its growth towards completion. This principle, appearing at its highest in man as mind, is the form, and efficient cause, and end of the physical organism, and by this principle Aristotle was able to explain organic life and growth everywhere as a development from the merely potential to the actual. Such a point of view anticipates modern inquiries into purposive forms of life, and links up with evolutionary ideas in general. Again, as a master of classification and an acute observer, Aristotle reveals prodigious ability in this sphere.

Of the six works collected by a later hand in the *Organon*, the *Prior Analytics* shaped once for all the doctrine of the syllogism, while the *Posterior Analytics* expounded the nature of exact or

ARISTOTLE: THE FATHER OF LEARNING

T. Callander, Former Prof. of Greek, Queen's Univ., Canada

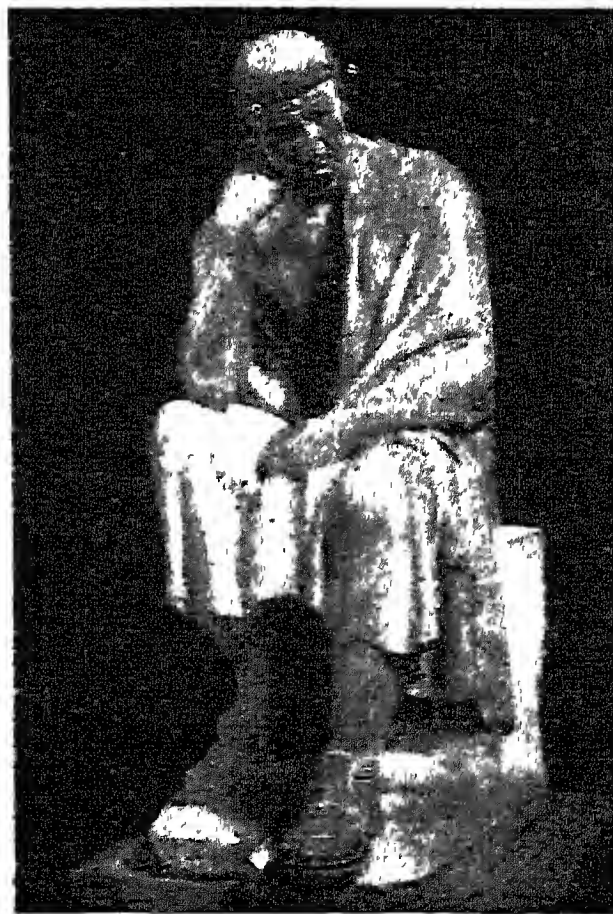
This sketch of the life and work of the great Greek scholar is a necessary preliminary to the study of many of the great branches of learning. See Ethics; Logic; Metaphysics; Philosophy, etc.

Aristotle, the Greek philosopher (384-322 B.C.), was born at Stagira in Macedonia. His father Nicomachus was physician to Amyntas II, grandfather of Alexander the Great. In 367 Aristotle went to Athens and spent 17 years in association with Plato. Several years of adventure in Mysia followed, including a romantic marriage. In 343 he was called to Macedonia by Philip to undertake the education of his son, then a boy of fourteen. A college was built, and for seven years, with interruptions, the profoundest intellect of the age was occupied with the training of the supreme man of action. When Alexander, in 334, passed into Asia "to subdue the world," Aristotle returned to Athens, founded his Peripatetic School at the Lyceum, and there, supported by gifts from his royal friend, lived for the next twelve years absorbed in lecturing and scientific research. In 323 death removed his protector and, mindful of the fate of Socrates, he retired to Euboea to spend the last months of his life in peace, declaring that Athens must not sin a second time against philosophy.

Aristotle and Plato

Platonism forms the background of Aristotle's thought. Like Plato, he views the universe as a system of particular things capable of being grouped according to kinds or species, each endowed with a nature that can be known. This nature is for Aristotle, as for Plato, not particular but universal, but the tendency in the master to affirm the superior reality of

universals or ideas against the multitude of particulars is modified in the pupil by his strong scientific and biological leanings. In Aristotle the conviction that ideas have no existence apart from



Aristotle, Greek philosopher who took all knowledge for his province
Statue in Spada Palace, Rome

things leads him to wage war against the supra-sensual ideas of the Platonists, while it stimulated his passion for exact and comprehensive observation. In every department of scientific inquiry he seeks to determine the facts, to register and classify the results, disposing of them in such a way that they reveal their true character and form the materials out of which higher generalisations may emerge. In such a spirit he takes the whole circle of knowledge

demonstrative science. On these rests the fame of Aristotle as the inventor of formal or, if the importance of the syllogism be accentuated, deductive logic. It was as a rival to the *Organon* that Bacon wrote his *Novum Organum*, thus earning the title of the inventor of inductive logic. Bacon professes to supply a theory or method of scientific discovery, whereas Aristotle, although he explicitly subordinates his theory of the syllogism to the wider problem of the nature of scientific inquiry, lays too much stress relatively on the form in which the results of discovery are set forth.

Aristotle's Poetics and Rhetoric

The *Poetics* not merely contains valuable information about the origin of tragedy, it lays the foundation of modern aesthetic. Unlike Plato, Aristotle makes the imitative character of poetry and art no reproach against their claim to be a valuable function of life, but rests upon that character the special capacity of all the arts to achieve their proper ends. That end is, in each case, the worthy employment of leisure, or true recreation, which is further defined in connexion with tragedy as the purgation of the emotions. By a flash of genius he divines the serious function of high art, and leaves to future criticism the task of developing the fertile suggestion thus thrown off. From the suggestion of idealising imitation the theory of the symbolic in art has evolved. In this difficult region Aristotle again is the starting-point for later investigation.

The same talents, combined with his sure and cultured taste, have made his three books on *Rhetoric* a classic. The main theme is oratory, treated as the art of producing conviction by persuasive speech. There are admirable sections on the emotions and how to control them, and on types of character, besides much refined criticism of diction and figurative speech. The fruits of his omnivorous reading are lavishly used and, if his neglect of lyric poetry throughout argues undue intellectualism in his mental make-up, he leaves a deep impression of broad and quick artistic sympathies.

In the *Ethics* and the *Politics* Aristotle analyses the Hellenic moral and political order, pronouncing it, with reservations, good. The supreme end is happiness, defined as an activity of the soul in accordance with virtue in a sufficiently long life. The external conditions of happiness having been briefly sketched, the *Ethics* pro-

ceeds to elaborate the morality of the Hellenic citizen, concluding with an attempt to bring the inner life so described into relation with the world of affairs. In opposition to the Stoics, Aristotle contended that external goods, environment generally, are not indifferent. Not negation but subordination is his maxim here. At the highest the good life will make every good thing serve its purpose. On the other hand he allows large scope to the capacity of virtue to rise superior even to hostile surroundings. In the *Politics*, while still remote from the Christian view which approves hardship as a condition for the promotion of virtue, he makes the striking concession to the good life that it may make a noble use of poverty and disease itself.

True to his governing principle of the mean, he rejects all extreme social and political programmes. He defends the family, and even justifies slavery in cases where the free citizen is of a superior race; he rejects communism and prefers aristocracy to either extreme of monarchy or democracy. A mixed constitution is best of all, and is most secure against civil strife, the bane of the Hellenic state. His plan of education is conceived in the most liberal spirit, and does full justice to the claims of disinterested culture as well as to the more obvious practical needs.

Among essays in the higher logic the *Metaphysics* is almost without a rival. Its subject is Being, not of a particular kind, but Being as such. How the universe of our experience, composed of a multitude of individuals and species, exposed to constant change, can form the subject of one science is a problem. In face of the difficulty Aristotle is assured that the Being or Essence of which every thing is a manifestation does present a proper object for treatment by a supreme science, which he calls first philosophy. This Being is alleged to be the only thing possessing reality by itself, and to it all other forms of being are referred.

The Immanence of Ideas

Thus, in spite of his emphatic denial of the independent existence of universals, and despite the prior reality which he claims for the individual, he recurs to the theory of Being or Essence as the first cause of every particular existence. In the particular he discerns, on a last analysis, four causes—material, formal, efficient, and final, but these are precisely what in combination constitute the object, converting the potential existence into the actual thing. As the appropriate

object of our highest knowledge this first essence is that which is most real: it is apprehended by mind, and ultimately is identified by Aristotle with God. Consult Greek text in e.g. Teubner or Loeb classical series; standard Eng. trans. pub. by O.U.P.; numerous other translations.

Arithmetic (Greek *arithmos*, number). The science of numbers. The primitive operation of arithmetic is counting; the process of addition affords a rapid and convenient method of counting, while the inverse operation, subtraction, may be regarded as a short method of counting backwards. Multiplication is a contracted form of addition, and division a contracted form of subtraction. Addition, subtraction, multiplication, and division make up the four fundamental rules of arithmetic. The concept of fractions is based on that of division. The invention of logarithms and the slide rule greatly simplified complicated arithmetical calculations.

Arithmetic, by its simplification of the operation of counting and the derived process of measurement, gives us a firm grip on the real physical world and reduces our vague ideas of number and quantity to precise form. It is of cardinal importance in commerce, government, war, and science, and in the business of life generally.

The development of arithmetic was long hampered by lack of a suitable notation. The number which in the present Arabic notation is written 888 was written by 3 letters ($\omega' \pi' \eta'$) in Greek, and 12 (DCCCLXXXVIII) in Roman, notation. The inconvenience of the Roman notation for arithmetical work is immediately obvious. In Greek notation one letter stands for eight hundred, another for eighty, a third for eight. In Arabic notation the symbol 8 signifies eight or eighty or eight hundred according to its position in the group of figures. The invention of the symbol 0 in the Arabic system was of decisive importance; it made possible discrimination between, e.g., 88 and 808. This simple idea of ascribing values to the symbols dependent on their relative positions produced a system which combines economy in the number of fundamental symbols required with compactness. The medieval invention of decimals to represent fractions (e.g. 1.7 for $1\frac{7}{10}$) substantially increased the flexibility of the Arabic system.

